APPENDIX A:
TIPPECANOE COUNTY REGIONAL ITS ARCHITECTURE MARKET PACKAGES

Individual Market Packages were developed to present the full implementation of a local ITS technology relevant to the National ITS Architecture, such as surface street control. Customized versions of the Market Packages were created for the Tippecanoe County RA based on the county's stakeholders and implemented ITS technologies.

For each Market Package the following information is provided in this order:

Full National ITS Architecture (for reference only):

1. Full Market Package Definition
2. User Services Related to the Market Package
3. Equipment Packages

Tippecanoe County ITS Architecture (customized from National ITS Architecture):

4. Principal Stakeholders
5. Data Dictionary
6. Customized Market Package Diagram
7. Flow Diagram

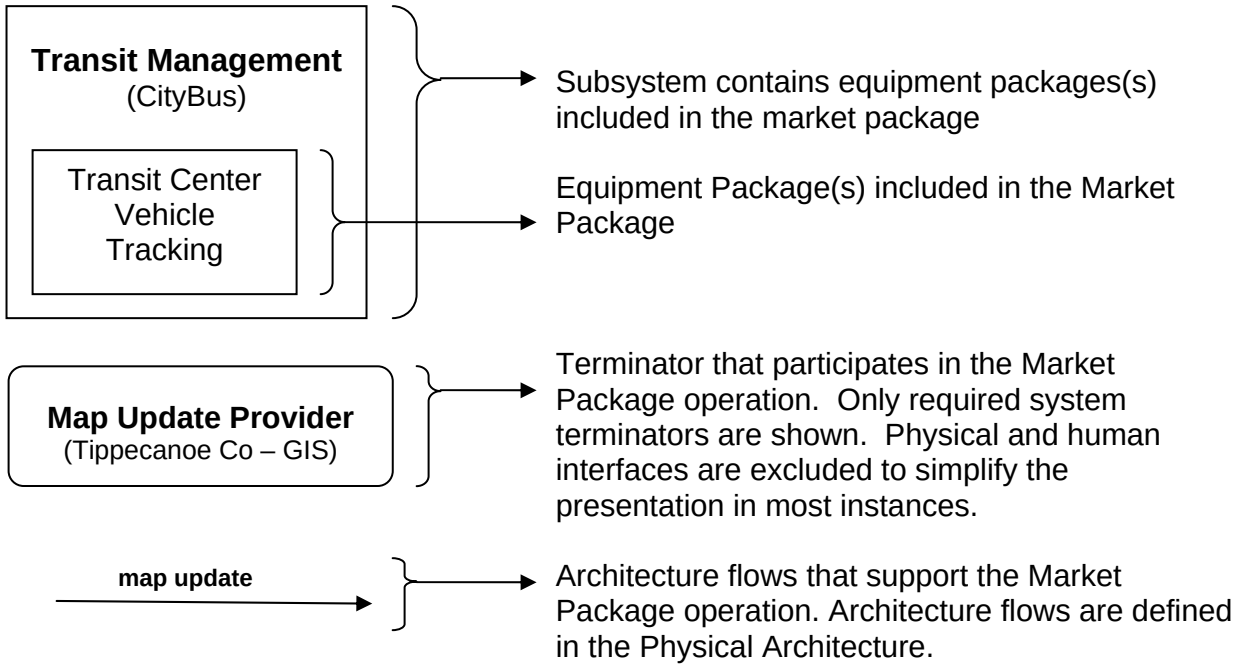
<u>TRAFFIC, ENGINEERING, AND MAINTENANCE AND CONSTRUCTION MANAGEMENT (MCM)</u>

1. Engineering, traffic management, and construction and maintenance departments were included as a single inventory element for each jurisdiction.
2. Websites providing information on construction activities were not included as a separate inventory in the Tippecanoe County RA. These websites, maintained by each MCM department, are considered a part of the MCM.
3. In general, maintenance and construction coordination between departments is follows:
   - Lafayette: INDOT, Tippecanoe Co., Lafayette, CityBus
   - West Lafayette: INDOT, Tippecanoe Co., Purdue, West Lafayette, CityBus
   - Purdue: INDOT, Tippecanoe Co., Purdue, West Lafayette, CityBus
   - Tippecanoe Co.: INDOT, Tippecanoe Co., Lafayette, West Lafayette, Purdue, Small Municipality
   - INDOT: INDOT, Tippecanoe Co., Lafayette, West Lafayette, Purdue, Small Municipality

<u>EMERGENCY MANAGEMENT</u>

In Tippecanoe County, Emergency Management agencies are integrated using a common Computer Aided Dispatch (CAD) system. All Public Service Answering Points (PSAPs) within the county are connected using the same software, sharing the same data, and accessing the same databases. Dispatch communications with responders utilizing 800MHz radio systems and on-board computing systems. Calls for any emergency/incident can be directed to any of the local responding units, if necessary. Therefore, interconnections to/from Emergency Management centers in Tippecanoe County exist between all local emergency responders, e.g., an emergency in West Lafayette may be answered by West Lafayette Police or as a backup by the Purdue Police or the Tippecanoe County Sheriff's Dept. It is also important to note, that the Indiana State Police are not on the local network and do not directly communicate with the local CAD system.

Below is the legend for the Customized Market Package diagrams.



FLOW TYPES

Existing Flow

ITS data is already transferred over an accepted ITS communications type between digital systems or advanced radio system.

Planned Flow

ITS data will be (based on current plans) transferred over an accepted ITS communications type from a computer system to a computer system

Traditional Communications or Phone Call

ITS data and information that is currently, or in the future will be, exchanged over an NON accepted ITS communications type. These types of flows apply to all land-line phone, cell, CB, and two-way radio calls used to report and exchange information. Normally these flows would not be included in the ITS architecture. However, these flows represent significant information exchange and were included, and classified as such, to retain the information flow. This flow type can also be considered as a 'planned' flow type if advanced communications are implemented.

AD1 – ITS Data Mart

Full Market Package Description:

This market package provides a focused archive that houses data collected and owned by a single agency, district, private sector provider, research institution, or other organization. This focused archive typically includes data covering a single transportation mode and one jurisdiction that is collected from an operational data store and archived for future use. It provides the basic data quality, data privacy, and meta data management common to all ITS archives and provides general query and report access to archive data users.

User Services Related to this Market Package: 7.1 Archived Data Function

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Archived Data Management Subsystem	**ITS Data Repository**	This equipment package collects data and data catalogs from one or more data sources and stores the data in a focused repository that is suited to a particular set of ITS data users. This equipment package includes capabilities for performing quality checks on the incoming data, error notification, and archive to archive coordination. This equipment package supports a broad range of implementations, ranging from simple data marts that collect a focused set of data and serve a particular user community to large-scale data warehouses that collect, integrate, and summarize transportation data from multiple sources and serve a broad array of users within a region.
	Traffic and Roadside Data	This equipment package collects and archives traffic, roadway, and environmental information for use in off-line planning, research, and analysis. The equipment package controls and collects information directly from equipment at the roadside, reflecting the deployment of traffic detectors that are used primarily for traffic monitoring and planning purposes rather than for traffic management.
	Government Reporting Systems Support	*This equipment package selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements.*
Emergency Management	**Emergency Data Collection**	This equipment package collects and stores emergency information that is collected in the course of operations by the Emergency Management Subsystem. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Roadway Subsystem	**Roadway Data Collection**	This equipment package collects traffic, road, and environmental conditions information for use in transportation planning, research, and other off-line applications where data quality and completeness take precedence over real-time performance. This equipment package includes the sensors, supporting roadside infrastructure, and communications equipment that collects and transfers information to a center for archival.
Traffic Management	**Traffic Data Collection**	This equipment package collects and stores traffic information that is collected in the course of traffic operations performed by the Traffic Management Subsystem. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.

Subsystem	Equipment Package	Description
Transit Management	**Transit Data Collection**	This equipment package collects and stores transit information that is collected in the course of transit operations performed by the Transit Management Subsystem. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Parking Management	*Parking Data Collection*	*This equipment package collects and stores parking information that is collected in the course of parking system operations performed by the Parking Management Subsystem. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.*
Commercial Vehicle Administration	*CV Data Collection*	*This equipment package collects and stores commercial vehicle information that is collected in the course of Commercial Vehicle Administration Subsystem operations. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.*
Emissions Management	*Emissions Data Collection*	*This equipment package collects and stores air quality and emissions management information that is collected in the course of Emissions Management Subsystem operations. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.*
Information Service Provider	*ISP Data Collection*	*This equipment package collects and stores traveler information that is collected in the course of operation of the ISP subsystem. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.*
Maintenance and Construction Management	*MCM Data Collection*	*This equipment package collects and stores maintenance and construction information that is collected in the course of operations by the Maintenance and Construction Management Subsystem. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.*
Toll Administration	*Toll Data Collection*	*This equipment package collects and stores toll information that is collected in the course of toll operations performed by the Toll Administration Subsystem. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.*

Customized AD1 Market Package Information for the Tippecanoe County ITS RA:

Principal Stakeholders:

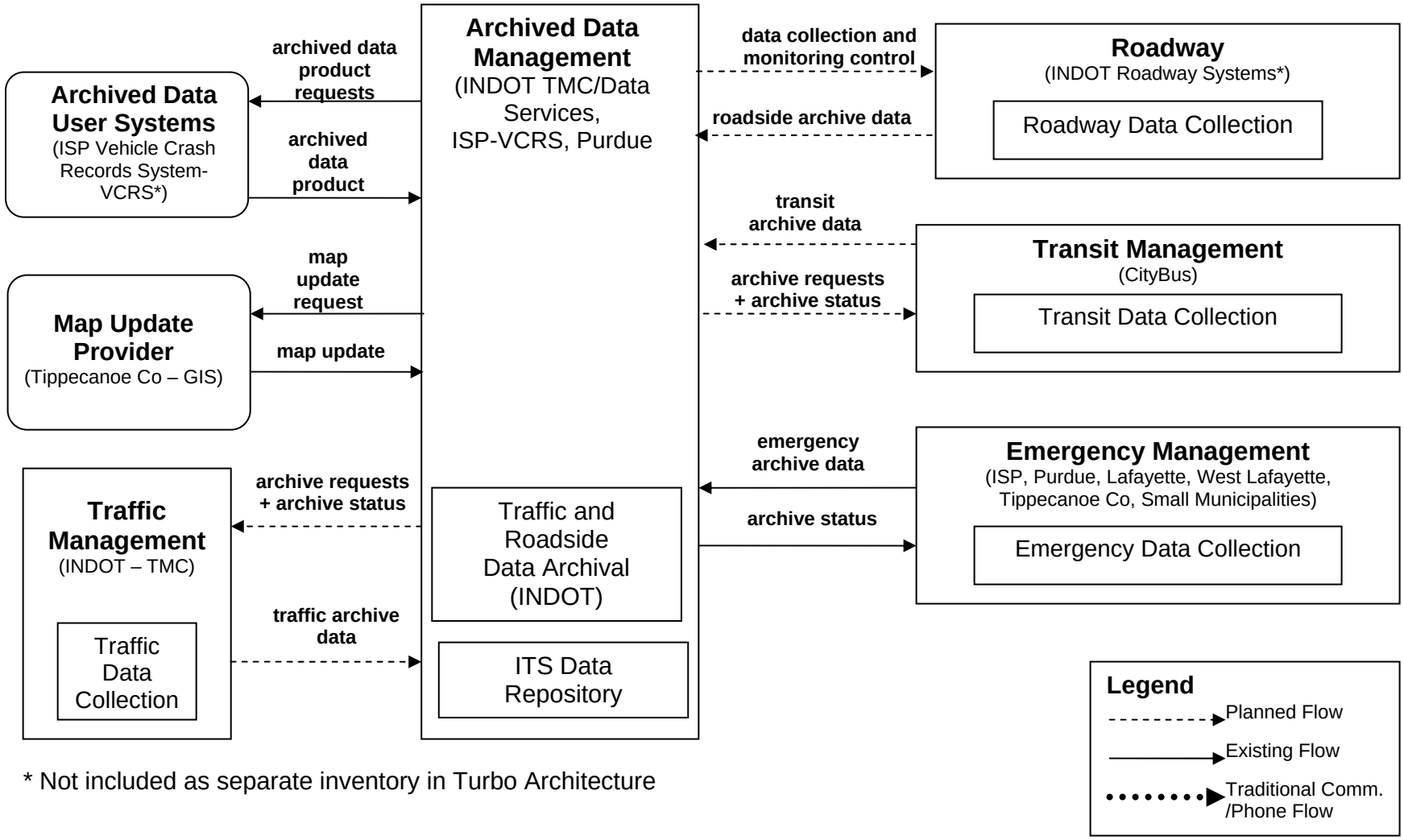
- Indiana State Police – Statewide Crash Records Information Database (Existing)
- Indiana Department of Transportation – Data Services (Existing)

Data Dictionary:

Flow Name	National Architecture Flow Definition
archive requests	A request to a data source for information on available data (i.e. "catalog") or a request that defines the data to be archived. The request can be a general subscription intended to initiate a continuous or regular data stream or a specific request intended to initiate a one-time response from the recipient.
archive status	Notification that data provided to an archive contains erroneous, missing, or suspicious data or verification that the data provided appears valid. If an error has been detected, the offending data and the nature of the potential problem are identified.
archived data product requests	A user-specified request for archived data products (i.e. data, meta data, or data catalogs). The request also includes information that is used to identify and authenticate the user and support electronic payment requirements, if any.
archived data products	Raw or processed data, meta data, data catalogs and other data products provided to a user system upon request. The response may also include any associated transaction information.
emergency archive data	Logged emergency information including information that characterizes identified incidents (routine highway incidents through disasters), corresponding incident response information, evacuation information, surveillance data, threat data, and resource information. Content may include a catalog of available information, the actual information to be archived and associated meta data that describes the archived information.
data collection and monitoring control	Information used to configure and control data collection and monitoring systems.
map update request	Request for a map update which could include a new underlying map or map layer updates.
map updates	Map update which could include a new underlying static or real-time map or map layer(s) update.
roadside archive data	A broad set of data derived from roadside sensors that include current traffic conditions, environmental conditions, and any other data that can be directly collected by roadside sensors. This data also indicates the status of the sensors and reports of any identified sensor faults.
traffic archive data	Information describing the use and vehicle composition on transportation facilities and the traffic control strategies employed. Content may include a catalog of available information, the actual information to be archived and associated meta data that describes the archived information.
transit archive data	Data used to describe and monitor transit demand, fares, operations, and system performance. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.

AD1 – ITS Data Mart

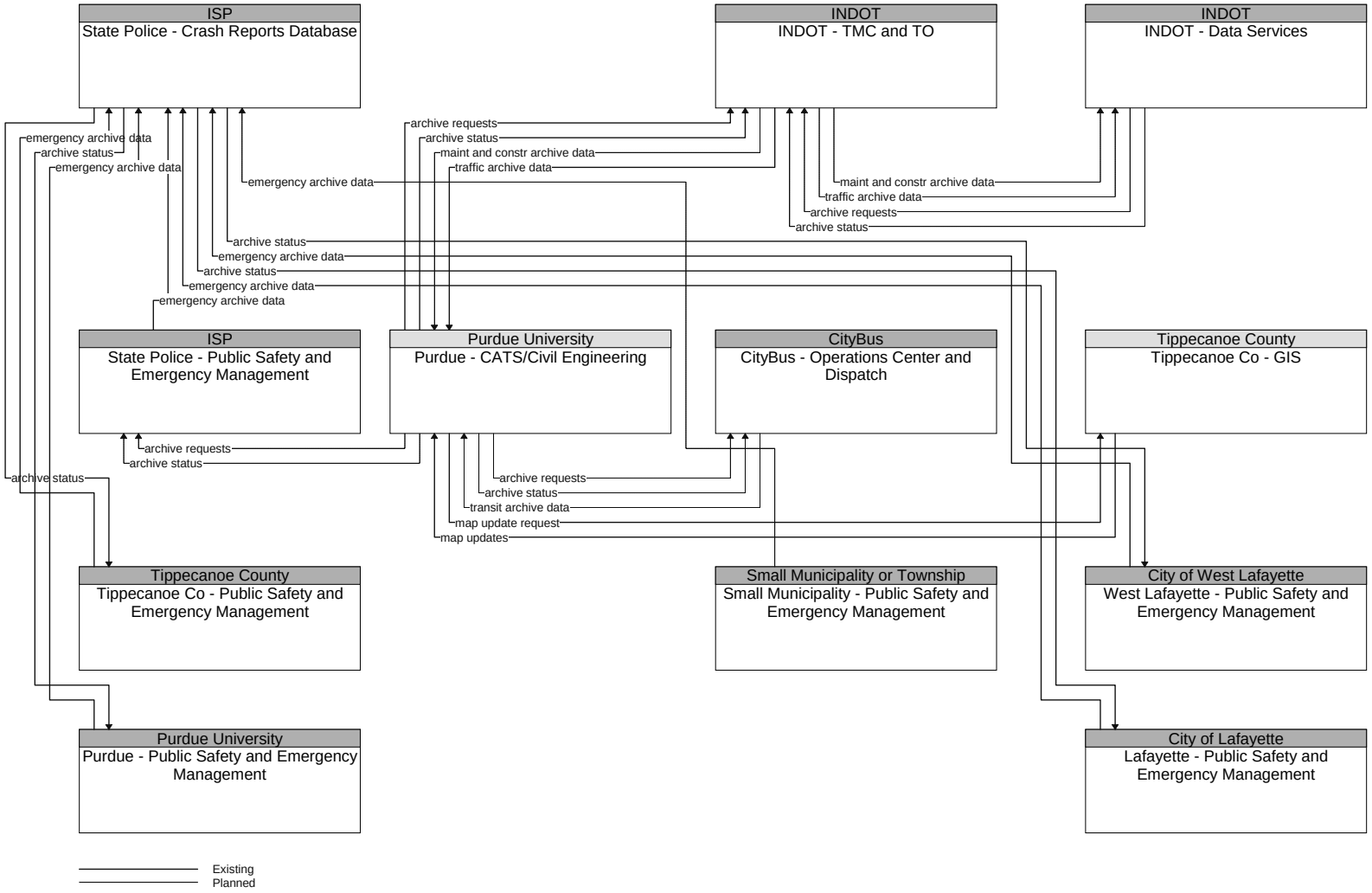
Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



* Not included as separate inventory in Turbo Architecture

AD1 – ITS Data Mart

Flow Diagram for the Tippecanoe County Regional ITS Architecture



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AD2: ITS Data Warehouse

Full Market Package Description:

This market package includes all the data collection and management capabilities provided by the ITS Data Mart, and adds the functionality and interface definitions that allow collection of data from multiple agencies and data sources spanning across modal and jurisdictional boundaries. It performs the additional transformations and provides the additional meta data management features that are necessary so that all this data can be managed in a single repository with consistent formats. The potential for large volumes of varied data suggests additional on-line analysis and data mining features that are also included in this market package in addition to the basic query and reporting user access features offered by the ITS Data Mart.

User Services Related to this Market Package: 7.1 Archived Data Function

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Archived Data Management Subsystem	*Government Reporting Systems Support*	*This equipment package selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements.*
	ITS Data Repository	This equipment package collects data and data catalogs from one or more data sources and stores the data in a focused repository that is suited to a particular set of ITS data users. This equipment package includes capabilities for performing quality checks on the incoming data, error notification, and archive to archive coordination. This equipment package supports a broad range of implementations, ranging from simple data marts that collect a focused set of data and serve a particular user community to large-scale data warehouses that collect, integrate, and summarize transportation data from multiple sources and serve a broad array of users within a region.
	Traffic and Roadside Data	This equipment package collects and archives traffic, roadway, and environmental information for use in off-line planning, research, and analysis. The equipment package controls and collects information directly from equipment at the roadside, reflecting the deployment of traffic detectors that are used primarily for traffic monitoring and planning purposes rather than for traffic management.
	On-Line Analysis and Mining	This equipment package provides advanced data analysis, summarization, and mining features that facilitate discovery of information, patterns, and correlations in large data sets. Multidimensional analysis, selective summarization and expansion of data details, and many other advanced analysis services may be offered by various implementations of this equipment package.
Commercial Vehicle Administration	*CV Data Collection*	*This equipment package collects and stores commercial vehicle information that is collected in the course of Commercial Vehicle Administration Subsystem operations. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.*

Subsystem	Equipment Package	Description
Emergency Management	*Emergency Data Collection*	*This equipment package collects and stores emergency information that is collected in the course of operations by the Emergency Management Subsystem. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.*
Emissions Management	*Emissions Data Collection*	*This equipment package collects and stores air quality and emissions management information that is collected in the course of Emissions Management Subsystem operations. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.*
Information Service Provider	**ISP Data Collection**	This equipment package collects and stores traveler information that is collected in the course of operation of the ISP subsystem. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Maintenance and Construction Management	**MCM Data Collection**	This equipment package collects and stores maintenance and construction information that is collected in the course of operations by the Maintenance and Construction Management Subsystem. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Parking Management	*Parking Data Collection*	*This equipment package collects and stores parking information that is collected in the course of parking system operations performed by the Parking Management Subsystem. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.*
Roadway Subsystem	*Roadway Data Collection*	*This equipment package collects traffic, road, and environmental conditions information for use in transportation planning, research, and other off-line applications where data quality and completeness take precedence over real-time performance. This equipment package includes the sensors, supporting roadside infrastructure, and communications equipment that collects and transfers information to a center for archival.*
Toll Administration	*Toll Data Collection*	*This equipment package collects and stores toll information that is collected in the course of toll operations performed by the Toll Administration Subsystem. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.*
Traffic Management	**Traffic Data Collection**	This equipment package collects and stores traffic information that is collected in the course of traffic operations performed by the Traffic Management Subsystem. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Transit Management	**Transit Data Collection**	This equipment package collects and stores transit information that is collected in the course of transit operations performed by the Transit Management Subsystem. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.

Customized AD2 Market Package Information for the Tippecanoe County ITS RA:

Principal Stakeholders:

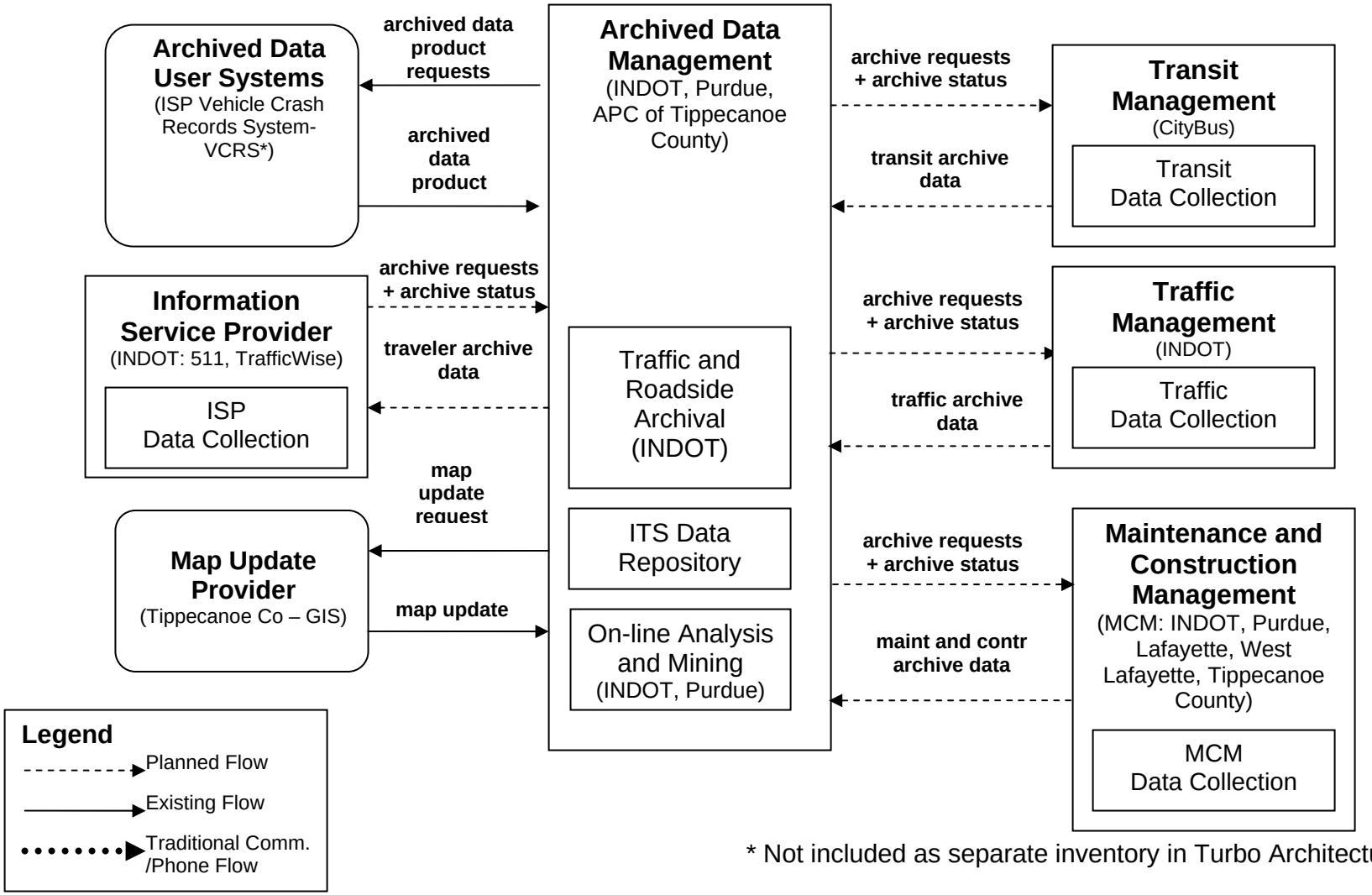
- INDOT - TMC and TO (Planned)
- Purdue - CATS/Civil Engineering (Planned)
- APC of Tippecanoe County (Planned)

Data Dictionary:

Flow Name	National Architecture Flow Definition
archive requests	A request to a data source for information on available data (i.e. "catalog") or a request that defines the data to be archived. The request can be a general subscription intended to initiate a continuous or regular data stream or a specific request intended to initiate a one-time response from the recipient.
archive status	Notification that data provided to an archive contains erroneous, missing, or suspicious data or verification that the data provided appears valid. If an error has been detected, the offending data and the nature of the potential problem are identified.
archived data product requests	A user-specified request for archived data products (i.e. data, meta data, or data catalogs). The request also includes information that is used to identify and authenticate the user and support electronic payment requirements, if any.
archived data products	Raw or processed data, meta data, data catalogs and other data products provided to a user system upon request. The response may also include any associated transaction information.
maint and constr archive data	Information describing road construction and maintenance activities identifying the type of activity, the work performed, and work zone information including work zone configuration and safety (e.g., a record of intrusions and vehicle speeds) information.
map update request	Request for a map update which could include a new underlying map or map layer updates.
map updates	Map update which could include a new underlying static or real-time map or map layer(s) update.
traffic archive data	Information describing the use and vehicle composition on transportation facilities and the traffic control strategies employed. Content may include a catalog of available information, the actual information to be archived and associated meta data that describes the archived information.
transit archive data	Data used to describe and monitor transit demand, fares, operations, and system performance. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.
traveler archive data	Data associated with traveler information services including service requests, facility usage, rideshare, routing, and traveler payment transaction data. Content may include a catalog of available information, the actual information to be archived and associated meta data that describes the archived information.

AD2: ITS Data Warehouse

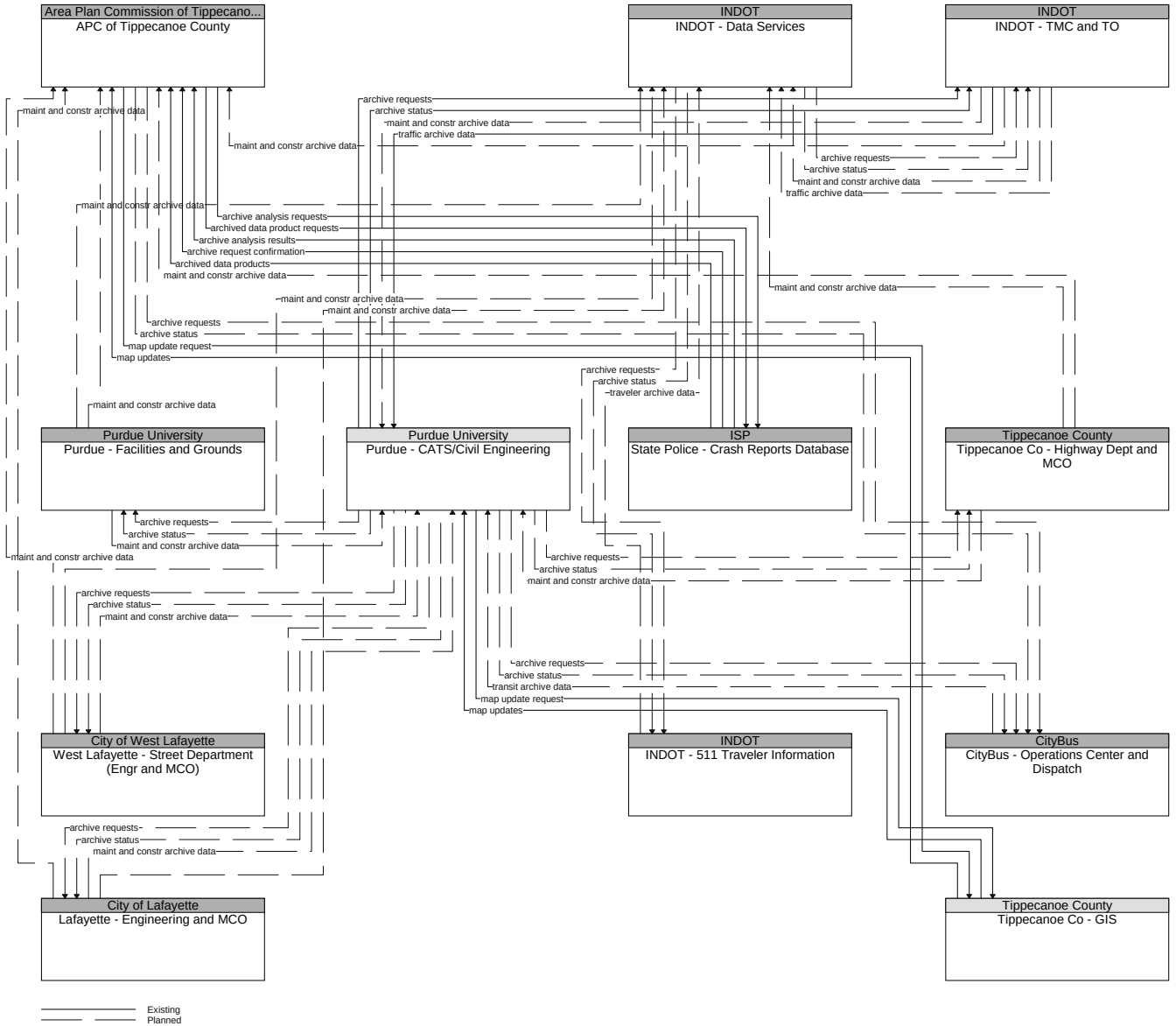
Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



* Not included as separate inventory in Turbo Architecture

AD2: ITS Data Warehouse

Flow Diagram for the Tippecanoe County Regional ITS Architecture



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APTS1: Transit Vehicle Tracking

Full Market Package Description:

This market package monitors current transit vehicle location using an Automated Vehicle Location System. The location data may be used to determine real time schedule adherence and update the transit system's schedule in real-time. Vehicle position may be determined either by the vehicle (e.g., through GPS) and relayed to the infrastructure or may be determined directly by the communications infrastructure. A two-way wireless communication link with the Transit Management Subsystem is used for relaying vehicle position and control measures. Fixed route transit systems may also employ beacons along the route to enable position determination and facilitate communications with each vehicle at fixed intervals. The Transit Management Subsystem processes this information, updates the transit schedule and makes real-time schedule information available to the Information Service Provider.

User Services Related to this Market Package:

1.1 Pre-trip Travel Information
1.2 En-route Driver Information

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Transit Management	**Transit Center Vehicle Tracking**	This equipment package monitors transit vehicle location. The location information is collected via a data communication link between the transit vehicles and the transit center. The location information is presented to the transit operator on a digitized map of the transit service area. The location data may be used to determine real time schedule adherence and update the transit system's schedule in real-time. The real-time schedule information is provided to Information Service Providers and the Transit Center Information Services equipment package, which furnish the information to travelers.
Transit Vehicle	**On-board Transit Trip Monitoring**	This on-board equipment package tracks vehicle location, monitors fuel usage, collects operational status (doors opened/closed, running times, etc.) and sends the collected, time stamped data to the Transit Management Subsystem.
Vehicle	**Vehicle Location Determination**	This equipment package determines current location of the vehicle using GPS or similar location referencing capability and provides this information to other equipment packages that use the location information to provide various ITS services.

Customized APTS1 Market Package Information for the Tippecanoe County ITS RA:

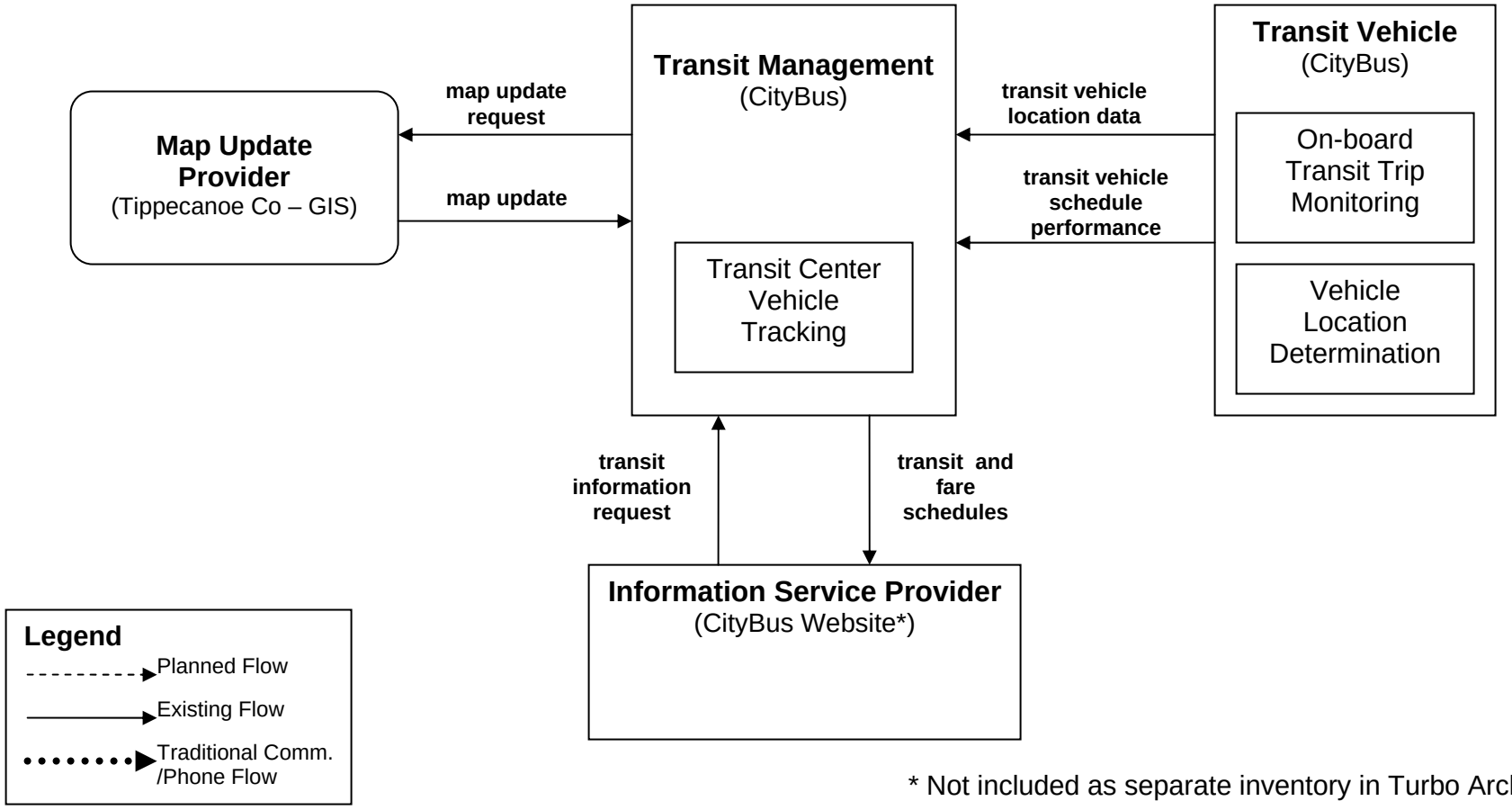
Principal Stakeholder: CityBus (Existing)

Data Dictionary:

Flow Name	National Architecture Flow Definition
map update request	Request for a map update which could include a new underlying map or map layer updates.
map updates	Map update which could include a new underlying static or real-time map or map layer(s) update.
transit and fare schedules	Transit service information including routes, schedules, schedule adherence, and fare information. Includes transit service information during evacuation.
transit information request	Request for transit operations information including schedule and fare information. The request can be a subscription that initiates as-needed information updates as well as a one-time request for information.
transit vehicle location data	Current transit vehicle location and related operational conditions data provided by a transit vehicle.
transit vehicle schedule performance	Estimated times of arrival and anticipated schedule deviations reported by a transit vehicle.

APTS1: Transit Vehicle Tracking

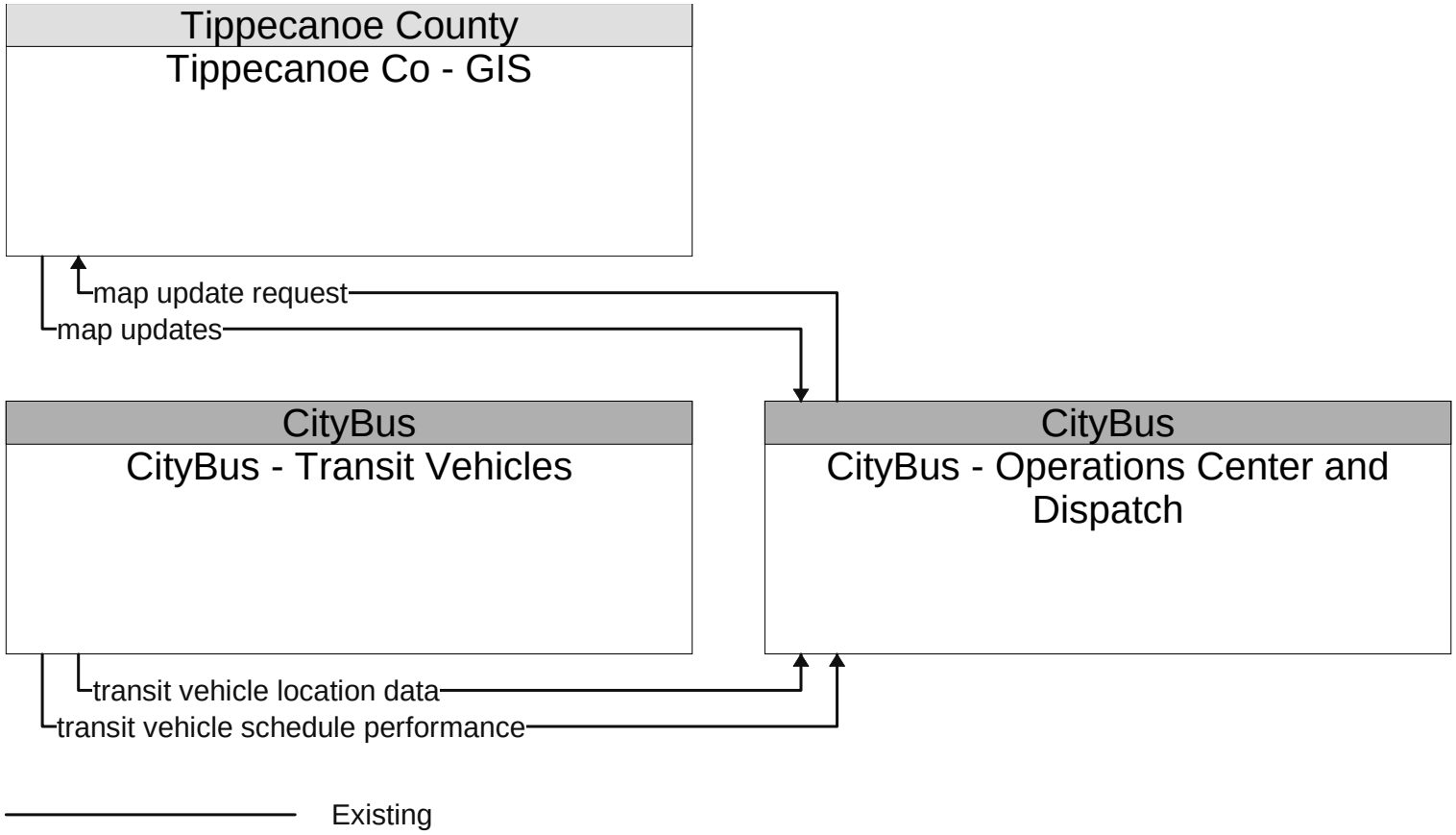
Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



* Not included as separate inventory in Turbo Architecture

APTS1: Transit Vehicle Tracking

Flow Diagram for the Tippecanoe County Regional ITS Architecture



APTS2: Transit Fixed-Route Operations

Full Market Package Description:

This market package performs vehicle routing and scheduling, as well as automatic operator assignment and system monitoring for fixed-route and flexible-route transit services. This service determines current schedule performance using AVL data and provides information displays at the Transit Management Subsystem. Static and real time transit data is exchanged with Information Service Providers where it is integrated with that from other transportation modes (e.g. rail, ferry, air) to provide the public with integrated and personalized dynamic schedules.

User Services Related to this Market Package: 2.1 Public Transportation Management

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Transit Management	**Transit Center Fixed-Route Operations**	This equipment package manages fixed route transit operations. It supports planning and scheduling of fixed and flexible route transit services. The package allows fixed-route and flexible-route transit services to develop and disseminate schedules and automatically updates customer service operator systems with the most current schedule information. This equipment package also supports automated dispatch of transit vehicles. Current vehicle schedule adherence and optimum scenarios for schedule adjustment are also provided.
	Transit Vehicle Operator Scheduling	This equipment package automates and supports the assignment of transit vehicles and operators to enhance the daily operation of a transit service. It provides the capability to assign operators to routes or service areas in a fair manner while minimizing labor and overtime services, considering operator preferences and qualifications, and automatically tracking and validating the number of work hours performed by each individual operator. This operator scheduling function is often performed at a Transit Garage facility.
Transit Vehicle	**On-board Fixed Route Schedule Management**	This on-board equipment package monitors schedule performance and identifies corrective actions when a deviation is detected. It provides two-way communication between the transit vehicle and center, enabling the center to communicate with the vehicle operator and monitor on-board systems.

Customized APTS2 Market Package Information for the Tippecanoe County ITS RA:

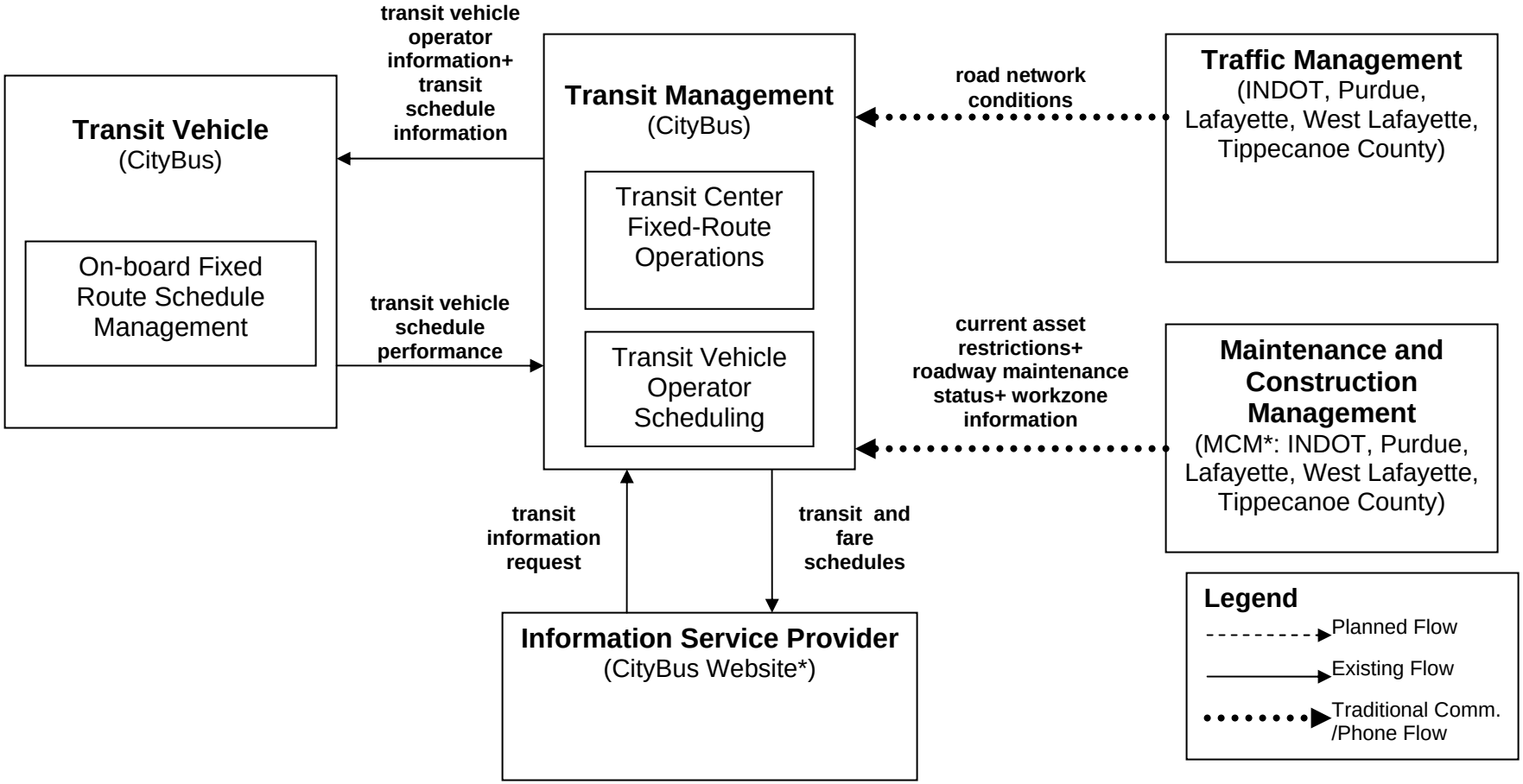
Principal Stakeholder: CityBus (Existing)

Data Dictionary:

Flow Name	National Architecture Flow Definition
current asset restrictions	Restrictions levied on transportation asset usage based on infrastructure design, surveys, tests, or analyses. This includes standard facility design height, width, and weight restrictions, special restrictions such as spring weight restrictions, and temporary facility restrictions that are imposed during maintenance and construction.
road network conditions	Current and forecasted traffic information, road and weather conditions, traffic incident information, and other road network status. Raw data, processed data, or some combination of both may be provided by this architecture flow. Information on diversions and alternate routes, closures, and special traffic in effect is also included.
roadway maintenance status	Summary of maintenance fleet operations affecting the road network. This includes the status of winter maintenance (snow plow schedule and current status).
transit and fare schedules	Transit service information including routes, schedules, schedule adherence, and fare information. Includes transit service information during evacuation.
transit information request	Request for transit operations information including schedule and fare information. The request can be a subscription that initiates as-needed information updates as well as a one-time request for information.
transit schedule information	Current and projected transit schedule adherence.
transit vehicle operator information	Transit service instructions, wide area alerts, traffic information, road conditions, and other information for both transit and paratransit operators.
transit vehicle schedule performance	Estimated times of arrival and anticipated schedule deviations reported by a transit vehicle.
work zone information	Summary of maintenance and construction work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.

APTS2: Transit Fixed-Route Operations

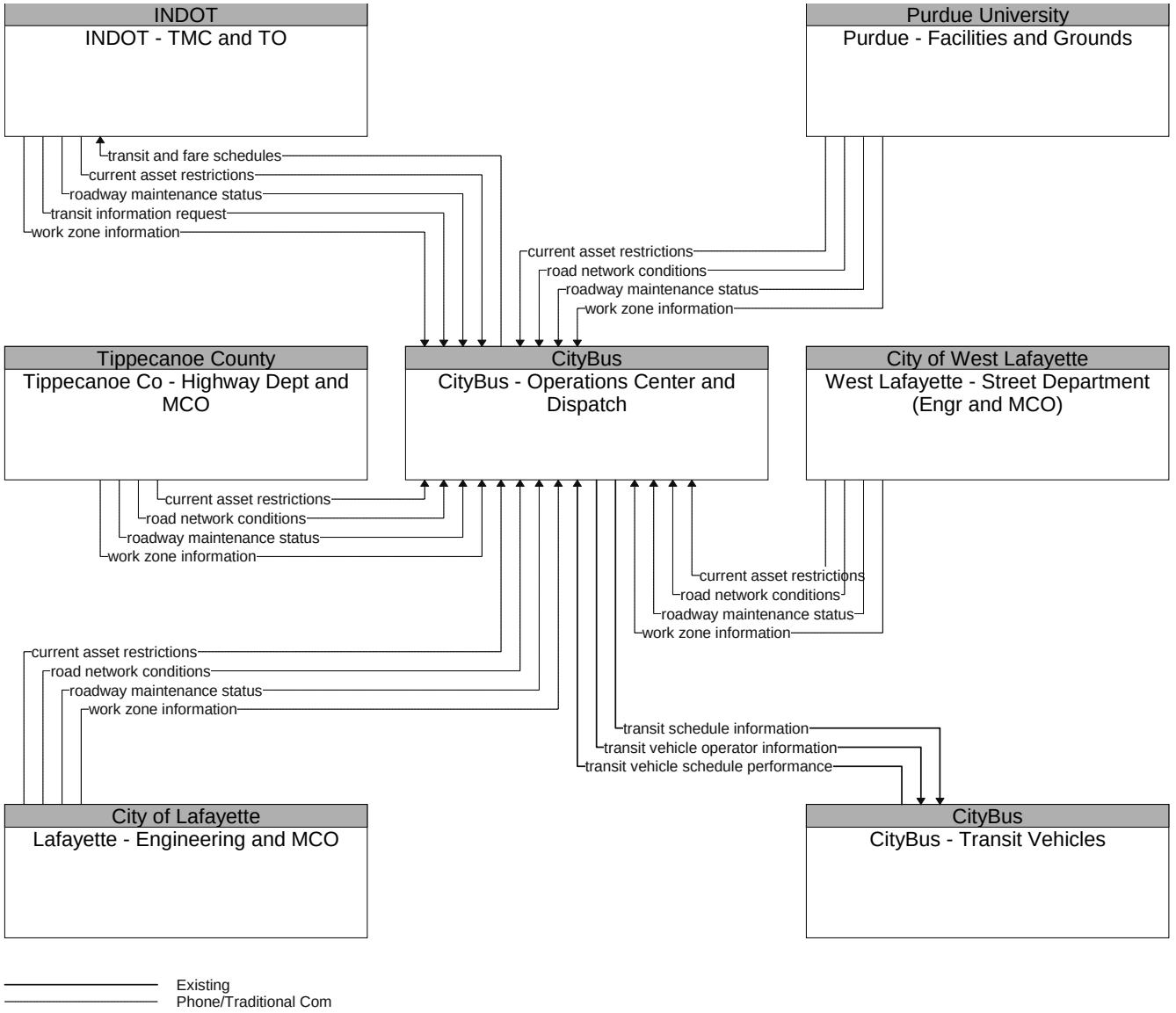
Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



* Not included as separate inventory in Turbo Architecture

APTS2: Transit Fixed-Route Operations

Customized Diagram for the Tippecanoe County Regional ITS Architecture



APTS3: Demand Response Transit Operations

Full Market Package Description:

This market package performs vehicle routing and scheduling as well as automatic operator assignment and monitoring for demand responsive transit services. In addition, this market package performs similar functions to support dynamic features of flexible-route transit services. This package monitors the current status of the transit fleet and supports allocation of these fleet resources to service incoming requests for transit service while also considering traffic conditions. The Transit Management Subsystem provides the necessary data processing and information display to assist the transit operator in making optimal use of the transit fleet. This service includes the capability for a traveler request for personalized transit services to be made through the Information Service Provider (ISP) Subsystem. The ISP may either be operated by a transit management center or be independently owned and operated by a separate service provider. In the first scenario, the traveler makes a direct request to a specific paratransit service. In the second scenario, a third party service provider determines that the paratransit service is a viable means of satisfying a traveler request and makes a reservation for the traveler.

User Services Related to this Market Package:

2.1 Public Transportation Management
2.3 Personalized Public Transit

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Transit Management	**Transit Center Paratransit Operations**	This equipment package manages demand responsive transit services, including paratransit services. It supports planning and scheduling of these services, allowing paratransit and other demand response transit services to plan efficient routes and better estimate arrival times. This equipment package also supports automated dispatch of paratransit vehicles. Customer service operator systems are updated with the most current schedule information.
	Transit Vehicle Operator Scheduling	This equipment package automates and supports the assignment of transit vehicles and operators to enhance the daily operation of a transit service. It provides the capability to assign operators to routes or service areas in a fair manner while minimizing labor and overtime services, considering operator preferences and qualifications, and automatically tracking and validating the number of work hours performed by each individual operator. This operator scheduling function is often performed at a Transit Garage facility.
Transit Vehicle	**On-board Paratransit Operations**	This on-board equipment package forwards paratransit and flexible-route dispatch requests to the operator and forwards acknowledgements to the center. It coordinates with, and assists the operator in managing multi-stop runs associated with demand responsive transit services including paratransit.

Customized APTS3 Market Package Information for the Tippecanoe County ITS RA:

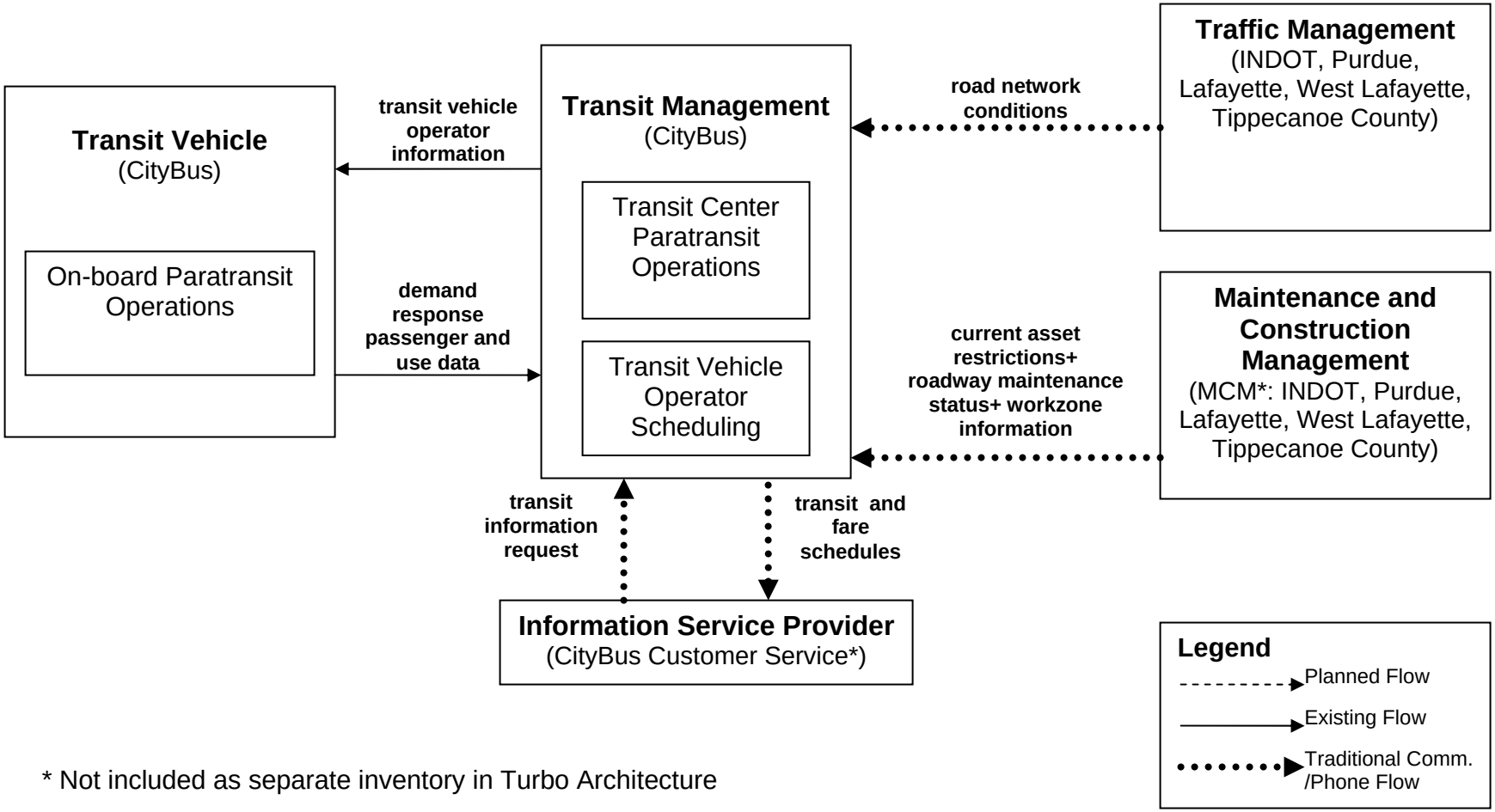
Principal Stakeholder: CityBus (Existing)

Data Dictionary:

Flow Name	National Architecture Flow Definition
current asset restrictions	Restrictions levied on transportation asset usage based on infrastructure design, surveys, tests, or analyses. This includes standard facility design height, width, and weight restrictions, special restrictions such as spring weight restrictions, and temporary facility restrictions that are imposed during maintenance and construction.
demand response passenger and use data	Data collected on board a demand response vehicle relating to the picking up and discharging of passengers
road network conditions	Current and forecasted traffic information, road and weather conditions, traffic incident information, and other road network status. Raw data, processed data, or some combination of both may be provided by this architecture flow. Information on diversions and alternate routes, closures, and special traffic in effect is also included.
roadway maint status	Summary of maintenance fleet operations affecting the road network. This includes the status of winter maintenance (snow plow schedule and current status).
transit and fare schedules	Transit service information including routes, schedules, schedule adherence, and fare information. Includes transit service information during evacuation.
transit information request	Request for transit operations information including schedule and fare information. The request can be a subscription that initiates as-needed information updates as well as a one-time request for information.
transit vehicle operator information	Transit service instructions, wide area alerts, traffic information, road conditions, and other information for both transit and paratransit operators.
work zone information	Summary of maintenance and construction work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.

APTS3: Demand Response Transit Operations

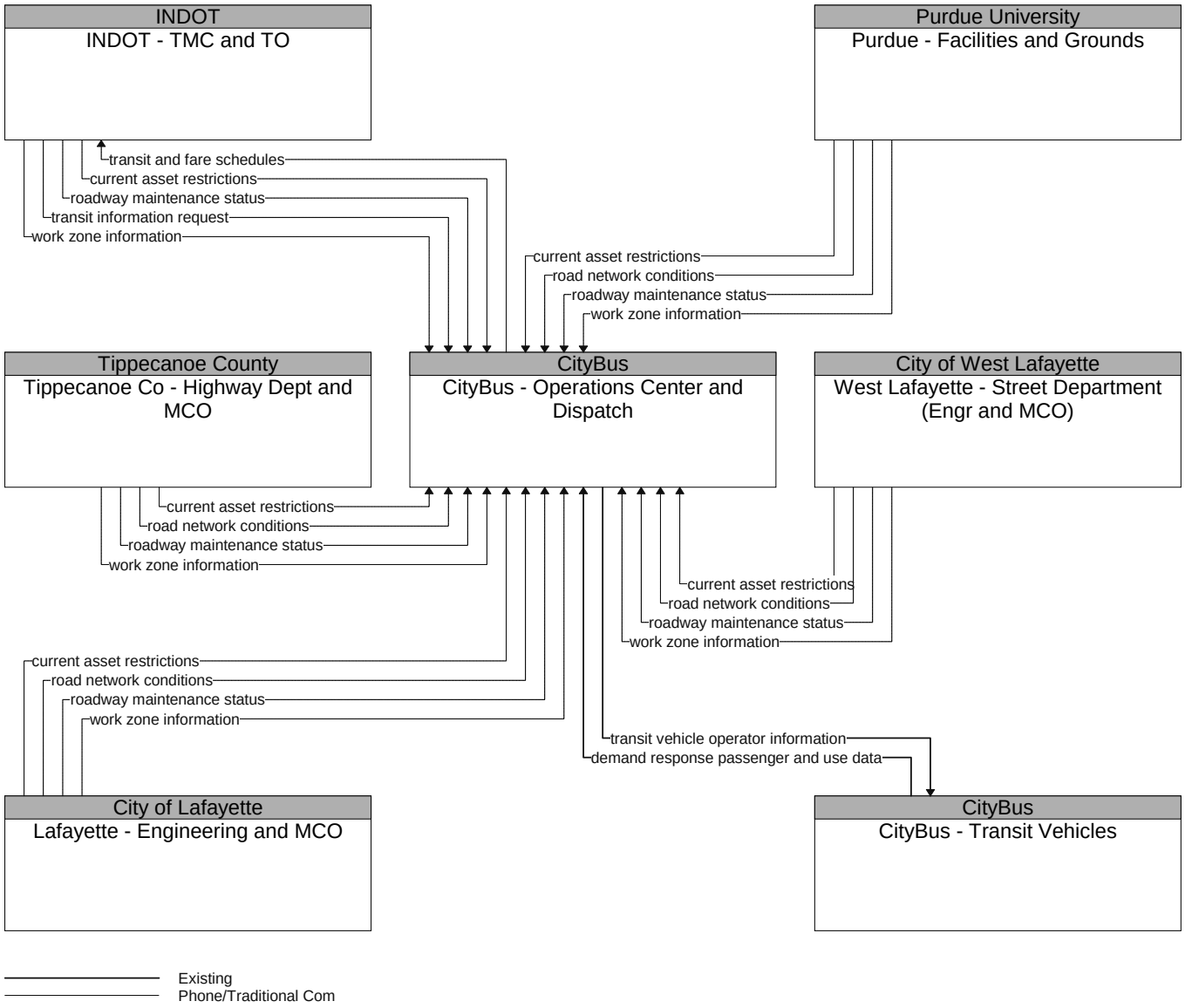
Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



* Not included as separate inventory in Turbo Architecture

APTS3: Demand Response Transit Operations

Flow Diagram for the Tippecanoe County Regional ITS Architecture



APTS5: Transit Security

Full Market Package Description:

This market package provides for the physical security of transit passengers and transit vehicle operators. On-board equipment is deployed to perform surveillance and sensor monitoring in order to warn of potentially hazardous situations. The surveillance equipment includes video (e.g., CCTV cameras), audio systems and/or event recorder systems. The sensor equipment includes threat sensors (e.g., chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors) and object detection sensors (e.g., metal detectors). Transit user or transit vehicle operator activated alarms are provided on-board. Public areas (e.g., transit stops, park and ride lots, stations) are also monitored with similar surveillance and sensor equipment and provided with transit user activated alarms. In addition this market package provides surveillance and sensor monitoring of non-public areas of transit facilities (e.g., transit yards) and transit infrastructure such as bridges, tunnels, and transit railways or bus rapid transit (BRT) guideways. The surveillance equipment includes video and/or audio systems. The sensor equipment includes threat sensors and object detection sensors as described above as well as, intrusion or motion detection sensors and infrastructure integrity monitoring (e.g., rail track continuity checking or bridge structural integrity monitoring).

The surveillance and sensor information is transmitted to the Emergency Management Subsystem, as are transit user activated alarms in public secure areas. On-board alarms, activated by transit users or transit vehicle operators are transmitted to both the Emergency Management Subsystem and the Transit Management Subsystem, indicating two possible approaches to implementing this market package.

In addition the market package supports remote transit vehicle disabling by the Transit Management Subsystem and transit vehicle operator authentication.

User Services Related to this Market Package:

2.1 Public Transportation Management
2.4 Public Travel Security
5.1 Emergency Notification and Personal Security

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Emergency Management	**Center Secure Area Alarm Support**	This equipment package receives traveler or transit vehicle operator alarm messages, notifies the system operator, and provides acknowledgement of alarm receipt back to the originator of the alarm. The alarms received can be generated by silent or audible alarm systems and may originate from public areas (e.g. transit stops, park and ride lots, transit stations, rest areas) or transit vehicles. The nature of the emergency may be determined based on the information in the alarm message as well as other inputs.

Subsystem	Equipment Package	Description
	Center Secure Area Sensor Management	*This equipment package manages sensors that monitor secure areas in the transportation system, processes the collected data, performs threat analysis in which data is correlated with other sensor, surveillance, and advisory inputs, and then disseminates resultant threat information to emergency personnel and other agencies. In response to identified threats, the operator may request activation of barrier and safeguard systems to preclude an incident, control access during and after an incident or mitigate impact of an incident. The sensors may be in secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. The types of sensors include acoustic, threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity, motion and object sensors.*
	Center Secure Area Surveillance	This equipment package monitors surveillance inputs from secure areas in the transportation system. The surveillance may be of secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. It provides both video and audio surveillance information to emergency personnel and automatically alerts emergency personnel of potential incidents.
	Emergency Response Management	This equipment package provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. This equipment package develops and stores emergency response plans and manages overall coordinated response to emergencies. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. This equipment package provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident.
Remote Traveler Support	**Remote Traveler Security**	This equipment package provides the capability to report an emergency or summon assistance from secure areas such as transit stops, transit stations, modal transfer facilities, rest stops and picnic areas, park-and-ride areas, tourism and travel information areas, and emergency pull off areas. This package includes interfaces that support initiation of an alarm and presentation of the returned alarm acknowledgement as well as a broadcast message to advise or warn the traveler.
	Traveler Secure Area Sensor Monitoring	*This equipment package includes sensors that monitor conditions of secure areas that are frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, etc). The equipment package monitors areas for environmental threats (e.g., chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), intrusion and motion, and object detection.*

Subsystem	Equipment Package	Description
	Traveler Secure Area Surveillance	This equipment package manages surveillance equipment that monitors secure areas in the transportation system that are frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, etc). This package collects the images and audio inputs at the secure area and provides the surveillance information to the Emergency Management Subsystem. The equipment package also provides local processing of the video or audio information, providing processed or analyzed results to the Emergency Management Subsystem. This equipment package provides the same functions as the Field Secure Area Surveillance equipment package.
Security Monitoring Subsystem	*Field Secure Area Sensor Monitoring*	*This equipment package includes sensors that monitor conditions of secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, and transit railways or guideways). A range of acoustic, environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity and motion and object sensors are included.*
	Field Secure Area Surveillance	*This equipment package includes video and audio surveillance equipment that monitors conditions of secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. as bridges, tunnels, interchanges, and transit railways or guideways). It provides the surveillance information to the Emergency Management Subsystem for possible threat detection. The equipment package also provides local processing of the video or audio information, providing processed or analyzed results to the Emergency Management Subsystem. This equipment package provides the same functions as the Traveler Secure Area Surveillance equipment package.*
Transit Management	**Transit Center Security**	This equipment package monitors transit vehicle operator or traveler activated alarms received from on-board a transit vehicle. It supports transit vehicle operator authentication and provides the capability to remotely disable a transit vehicle. This equipment package also includes the capability to alert operators and police to potential incidents identified by these security features.
Transit Vehicle	**On-board Transit Security**	This equipment package provides security and safety functions on-board the transit vehicle. It includes surveillance and sensor systems that monitor the on-board environment, silent alarms that can be activated by transit user or vehicle operator, operator authentication, and a remote vehicle disable function. The surveillance equipment includes video (e.g. CCTV cameras), audio systems and/or event recorder systems. The sensor equipment includes threat sensors (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors) and object detection sensors (e.g. metal detectors).

Customized APTS05 Market Package Information for the Tippecanoe County ITS RA:

Principal Stakeholders:

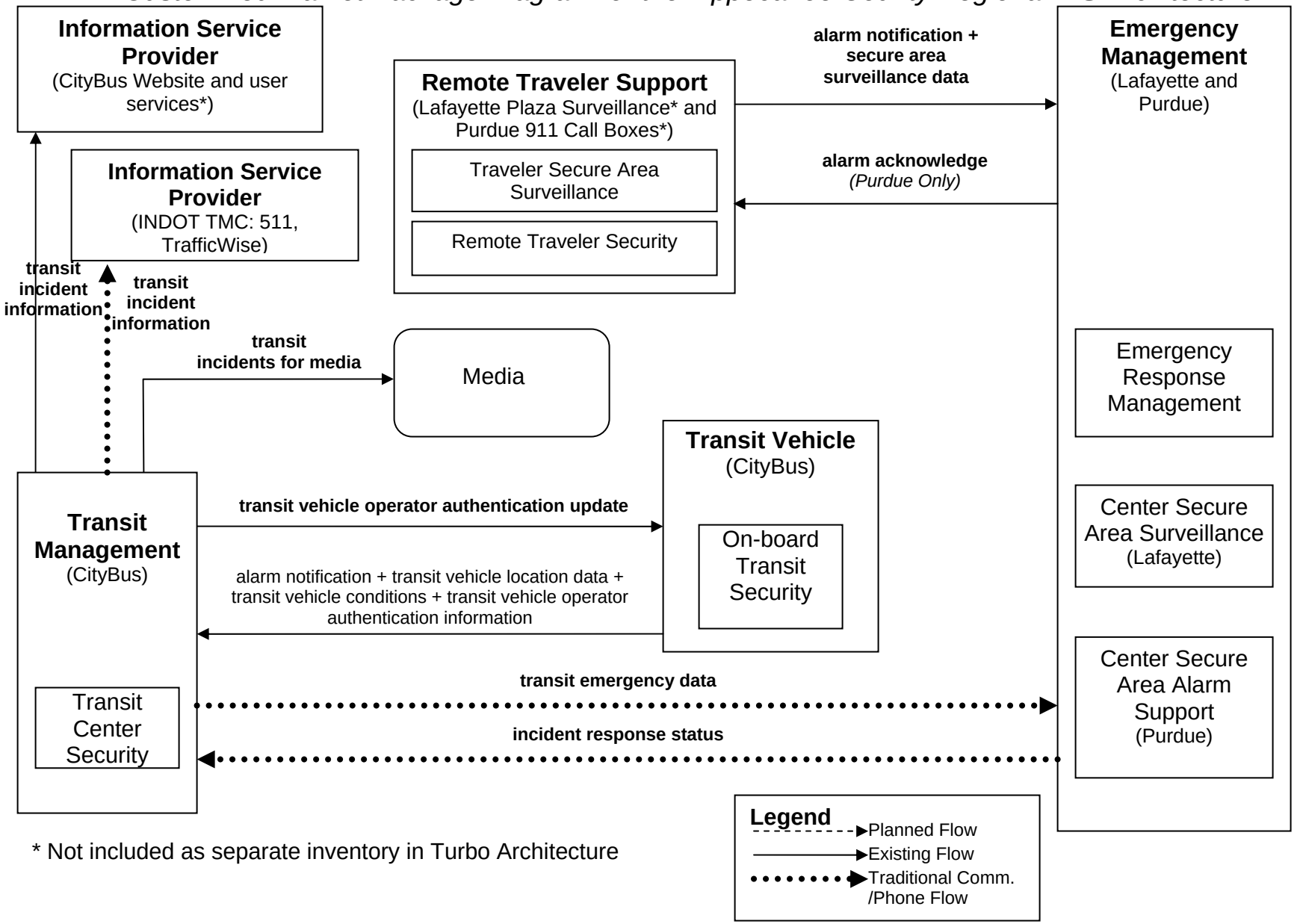
- CityBus (Existing)
- Lafayette Public Safety and Emergency Management (Existing)
- Purdue Public Safety and Emergency Management (Existing)
- INDOT TMC, 511, TrafficWise

Data Dictionary:

Flow Name	National Architecture Flow Definition
alarm acknowledge	Confirmation that alarm was received, instructions and additional information for the alarm initiator, and requests for additional information.
alarm notification	Notification of activation of an audible or silent alarm by a traveler in a public area or by a transit vehicle operator using an on-board device.
incident response status	Status of the current incident response including a summary of incident status and its impact on the transportation system, traffic management strategies implemented at the site (e.g., closures, diversions, traffic signal control overrides), and current and planned response activities.
secure area surveillance control	Information used to configure and control audio and video surveillance systems used for transportation infrastructure security in secure areas. The provided information controls surveillance data collection, aggregation, filtering, and other local processing.
secure area surveillance data	Data collected from surveillance systems used to monitor secure areas. Includes video, audio, processed surveillance data, equipment operational status, and alarm indicators when a threat has been detected.
threat information	Threats regarding transportation infrastructure, facilities, or systems detected by a variety of methods (sensors, surveillance, threat analysis of advisories from outside agencies, etc.).
transit emergency data	Initial notification of transit emergency at a transit stop or on transit vehicles and further coordination as additional details become available and the response is coordinated.
transit incident information	Information on transit incidents that impact transit services for public dissemination.
transit incidents for media	Report of an incident impacting transit operations for public dissemination through the media.
transit vehicle location data	Current transit vehicle location and related operational conditions data provided by a transit vehicle.
transit vehicle operator authentication information	Information regarding on-board transit operator authentication
transit vehicle operator authentication update	Results of authentication process or update of on-board authentication database.

APTS5: Transit Security

Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



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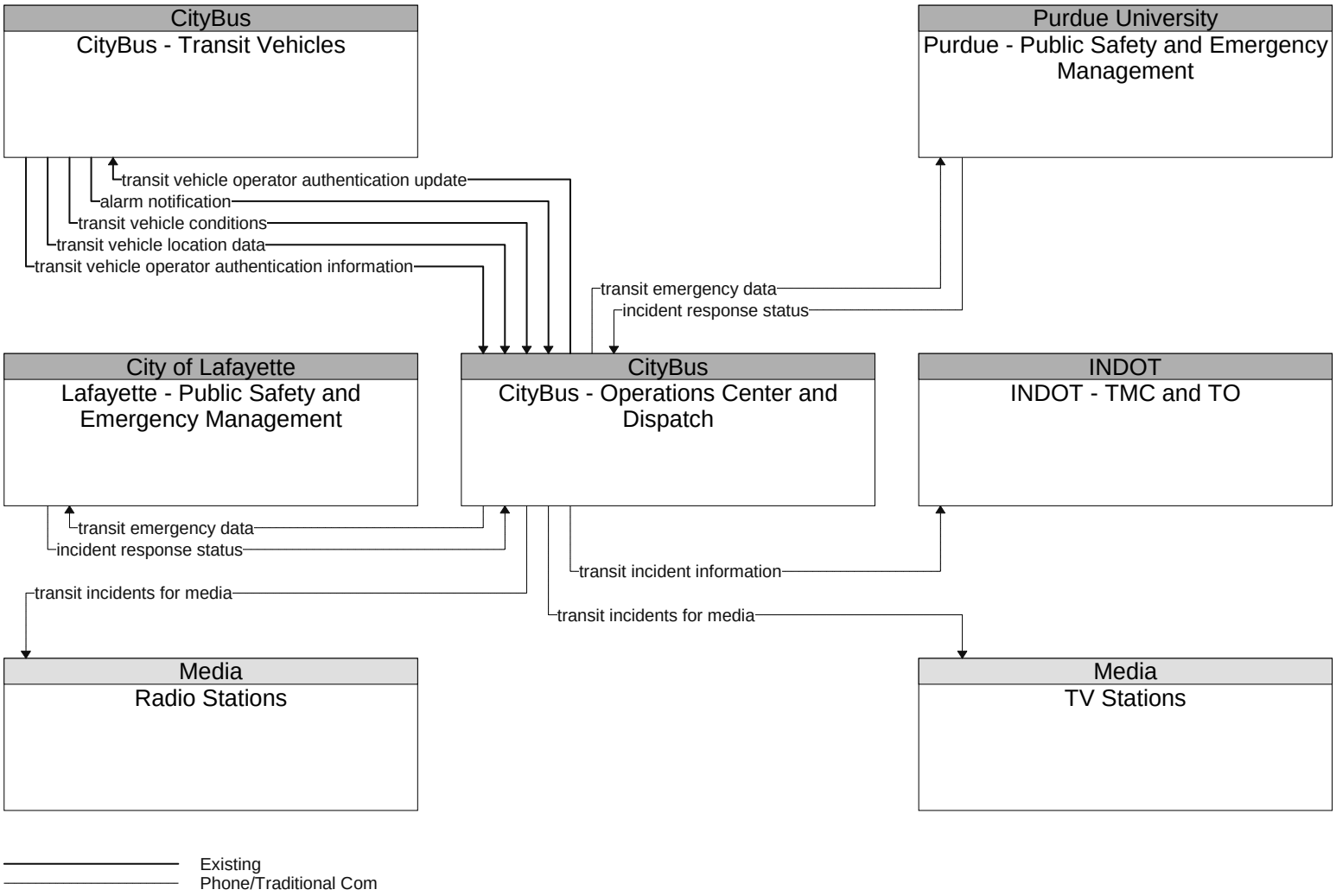
APTS5: Transit Security

Flow Diagram for the Tippecanoe County Regional ITS Architecture



APTS6: Transit Fleet Management

Full Market Package Description:

This market package supports automatic transit maintenance scheduling and monitoring. On-board condition sensors monitor system status and transmit critical status information to the Transit Management Subsystem. Hardware and software in the Transit Management Subsystem processes this data and schedules preventative and corrective maintenance. The market package also supports the day to day management of the transit fleet inventory, including the assignment of specific transit vehicles to blocks.

User Services Related to this Market Package: 2.1 Public Transportation Management

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Transit Management	**Transit Garage Maintenance**	This equipment package provides advanced maintenance functions for the transit property. It collects operational and maintenance data from transit vehicles, manages vehicle service histories, and monitors operators and vehicles. It collects vehicle mileage data and uses it to automatically generate preventative maintenance schedules for each vehicle by utilizing vehicle tracking data from a prerequisite vehicle tracking equipment package. In addition, it provides information to proper service personnel to support maintenance activities and records and verifies that maintenance work was performed.
	Transit Vehicle Assignment	This equipment package assigns individual transit vehicles to vehicle blocks and downloads this information to the transit vehicle. It also provides an exception handling process for the vehicle assignment function to generate new, supplemental vehicle assignments when required by changes during the operating day. It provides an inventory management function for the transit facility which stores functional attributes about each of the vehicles owned by the transit operator. These attributes permit the planning and assignment functions to match vehicles with routes based on suitability for the types of service required by the particular routes.
Transit Vehicle	**On-board Maintenance**	This on-board equipment package collects and processes transit vehicle maintenance data including mileage and vehicle operating conditions. This maintenance information is provided to the management center and used to schedule future vehicle maintenance and repair.
	On-board Schedule Management	*This on-board equipment package monitors schedule performance and identifies corrective actions when a deviation is detected. It provides two-way communication between the transit vehicle and center, enabling the center to communicate with the vehicle operator and monitor on-board systems.*

Customized APTS6 Market Package Information for the Tippecanoe County ITS RA:

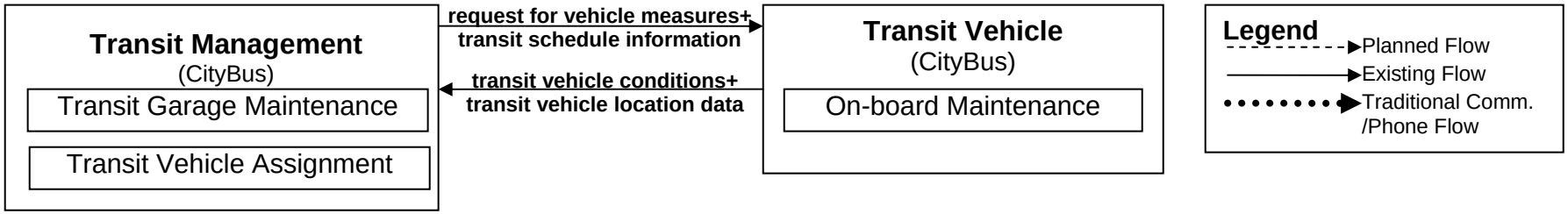
Principal Stakeholder: CityBus (Existing)

Data Dictionary:

Flow Name	National Architecture Definition
request for vehicle measures	Request for vehicle performance and maintenance data collected by onboard sensors.
transit vehicle conditions	Operating conditions of transit vehicle (e.g., engine running, oil pressure, or mileage).
transit vehicle location data	Current transit vehicle location and related operational conditions data provided by a transit vehicle.
transit schedule information	Current and projected transit schedule information used to initialize the transit vehicle with a vehicle assignment, monitor schedule performance, and develop corrective actions on-board.

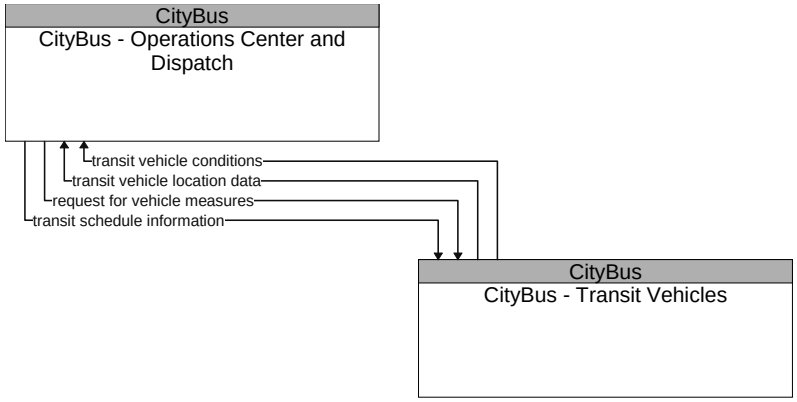
APTS6: Transit Fleet Management

Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



APTS6: Transit Fleet Maintenance

Flow Diagram for the Tippecanoe County Regional ITS Architecture



APTS8: Transit Traveler Information

Full Market Package Description:

This market package provides transit users at transit stops and on-board transit vehicles with ready access to transit information. The information services include transit stop annunciation, imminent arrival signs, and real-time transit schedule displays that are of general interest to transit users. Systems that provide custom transit trip itineraries and other tailored transit information services are also represented by this market package.

User Services Related to this Market Package:

2.1 Public Transportation Management
2.2 En-route Transit Information
3.1 Electronic Payment Services (not implemented in Tippecanoe County RA)

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Information Service Provider	**Infrastructure Provided Trip Planning**	This equipment package provides pre-trip and en-route trip planning services for travelers. It receives origin, destination, constraints, and preferences and returns trip plan(s) that meet the supplied criteria. Trip plans may be based on current traffic and road conditions, transit schedule information, and other real-time traveler information. Candidate trip plans are multimodal and may include vehicle, transit, and alternate mode segments (e.g., rail, ferry, bicycle routes, and walkways) based on traveler preferences. This equipment package also confirms the trip plan for the traveler and supports reservations and advanced payment for portions of the trip. The trip plan includes specific routing information and instructions for each segment of the trip and may also include information and reservations fo additional services (e.g., parking) along the route.
	ISP Traveler Data Collection	This equipment package collects traveler-related data from other centers, consolidates, verifies, and refines the collected data, and makes this data available in a consistent format to applications that deliver traveler information. A broad range of traveler-related data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. This equipment package also shares data with other information service providers.
Personal Information Access	**Personal Interactive Information Reception**	This equipment package provides traffic information, road conditions, transit information, yellow pages (traveler services) information, special event information, and other traveler information that is specifically tailored based on th traveler's request and/or previously submitted traveler profile information. The interactive traveler information capability is provided by personal devices including personal computers and personal portable devices such as personal digital assistants (PDAs).

Subsystem	Equipment Package	Description
Remote Traveler Support	**Remote Transit Information Services**	This equipment package furnishes transit users with real-time travel-related information at transit stops, multi-modal transfer points, and other public transportation areas. It provides transit users with information on transit routes, schedules, transfer options, available services, fares, and real-time schedule adherence. In addition to tailored information for individual transit users, this equipment package supports general annunciation and/or display of imminent arrival information and other information of general interest to transit users.
Transit Management	**Transit Center Information Services**	This equipment package collects the latest available information for a transit service and makes it available to transit customers and to Information Service Providers for further distribution. Customers are provided information at transit stops and other public transportation areas before they embark and on-board the transit vehicle once they are enroute. Information provided can include the latest available information on transit routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, yellow pages, and special events In addition to general service information, tailored information (e.g., itineraries) are provided to individual transit users
Transit Vehicle	**On-board Transit Information Services**	This equipment package furnishes en-route transit users with real-time travel-related information on-board a transit vehicle. Current information that can be provided to transit users includes transit routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, non-motorized transportation services, ar special events are provided. In addition to tailored information for individual transit users, this equipment package als supports general annunciation and/or display of general schedule information, imminent arrival information, and othe information of general interest to transit users.

Customized APTS8 Market Package Information for the Tippecanoe County ITS RA:

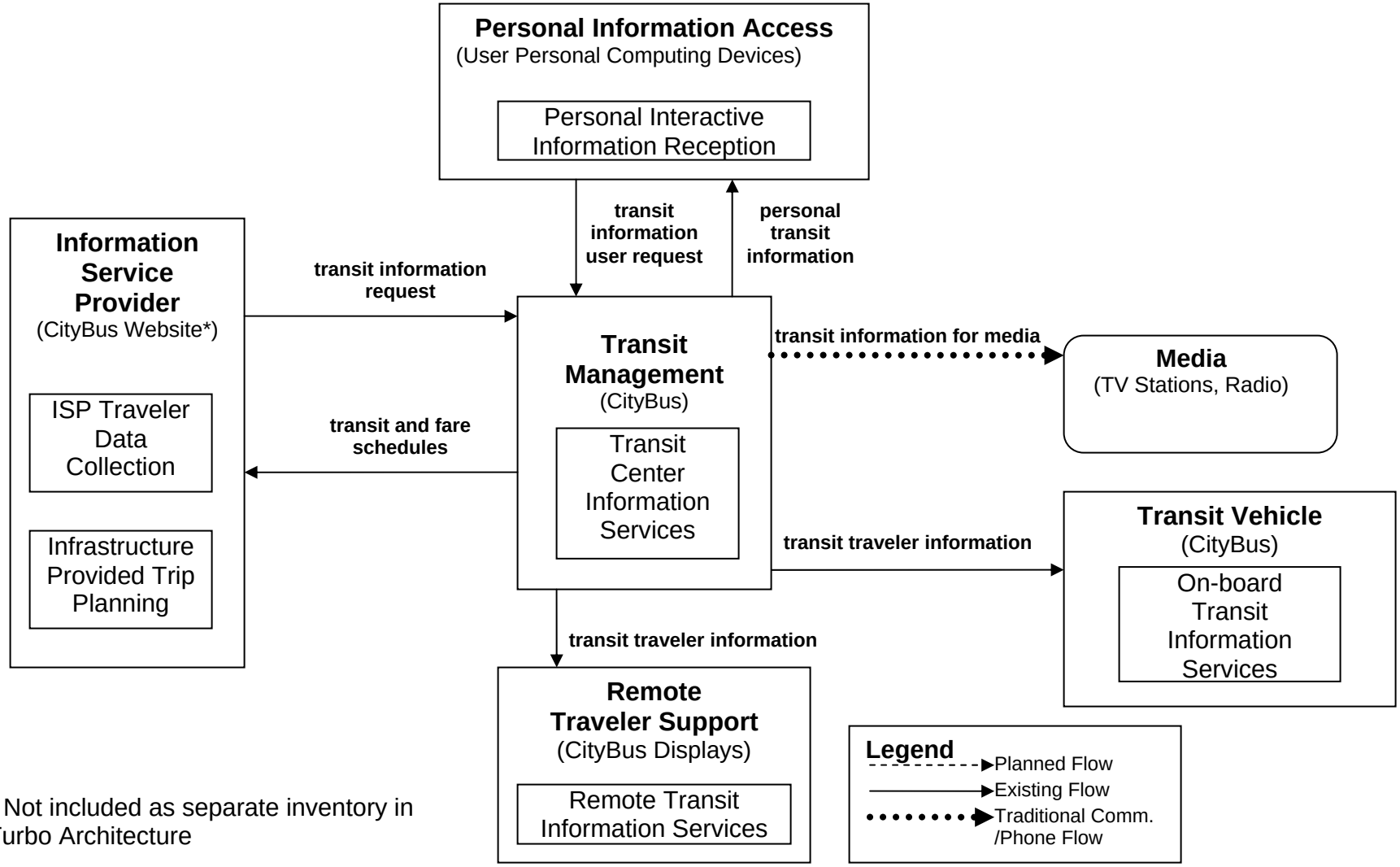
Principal Stakeholder: CityBus (Existing)

Data Dictionary:

Flow Name	National Architecture Flow Definition
personal transit information	General and personalized transit information for a particular fixed route, flexible route, or paratransit system.
transit and fare schedules	Transit service information including routes, schedules, schedule adherence, and fare information. Includes transit service information during evacuation.
transit information for media	Report of transit schedule deviations for public dissemination through the media.
transit information request	Request for transit operations information including schedule and fare information. The request can be a subscription that initiates as-needed information updates as well as a one-time request for information.
transit traveler information	Transit information prepared to support transit users and other travelers. It contains transit schedules, real-time arrival information, fare schedules, alerts and advisories, and general transit service information.

APTS8: Transit Traveler Information

Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



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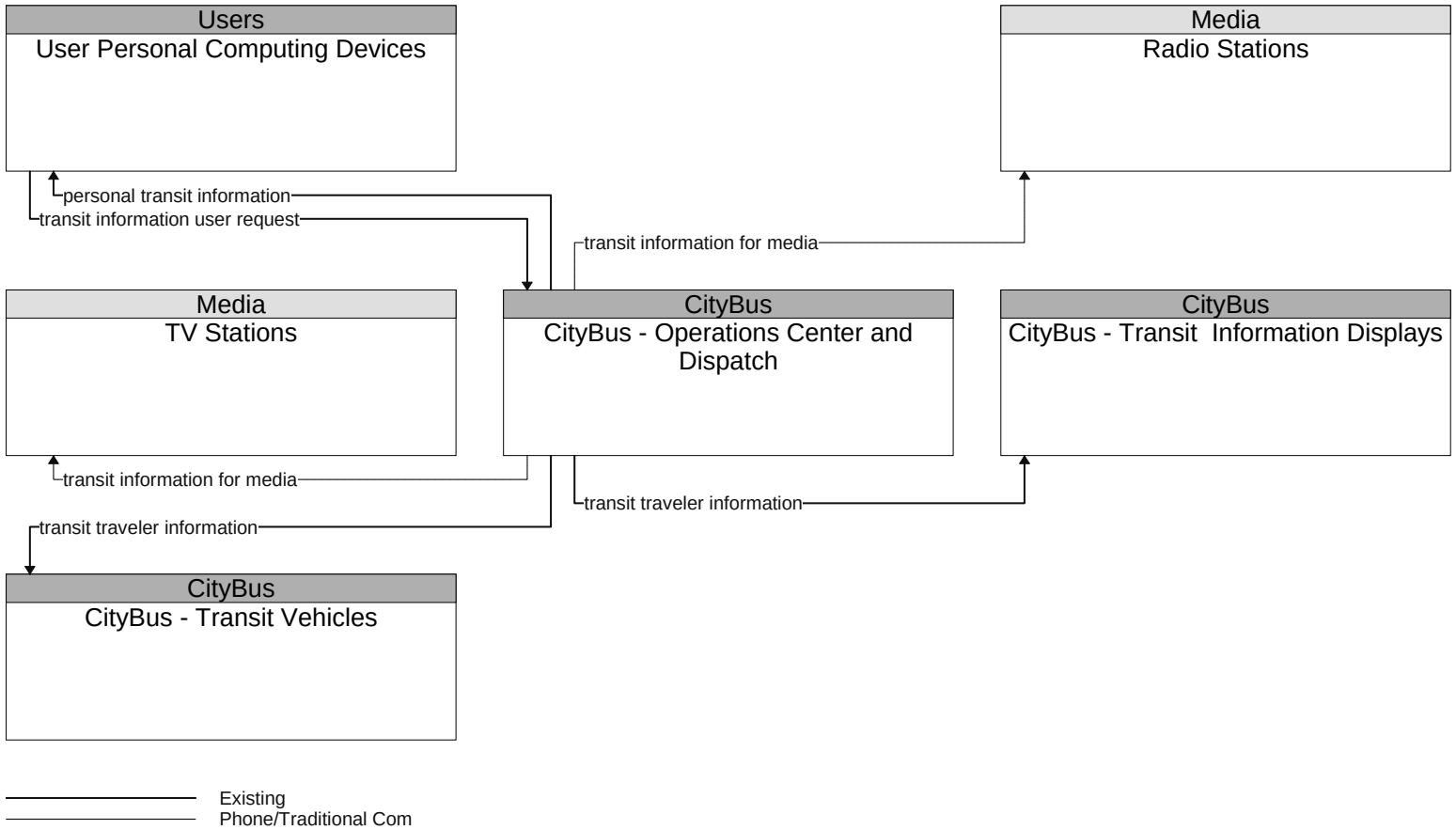
APTS8: Transit Traveler Information

Flow Diagram for the Tippecanoe County Regional ITS Architecture



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APTS10: Transit Passenger Counting

Full Market Package Description:

This market package counts the number of passengers entering and exiting a transit vehicle using sensors mounted on the vehicle and communicates the collected passenger data back to the management center. The collected data can be used to calculate reliable ridership figures and measure passenger load information at particular stops.

User Services Related to this Market Package:

2.1 Public Transportation Management

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Transit Management	Transit Center Passenger Counting	This equipment package receives and processes transit vehicle loading data using two-way communications from equipped transit vehicles.
Transit Vehicle Subsystem	On-board Passenger Counting	This on-board equipment package collects transit vehicle loading data and makes it available to the center. It provides two-way communication between the transit vehicle and center.

Customized APTS10 Market Package Information for the Tippecanoe County ITS RA:

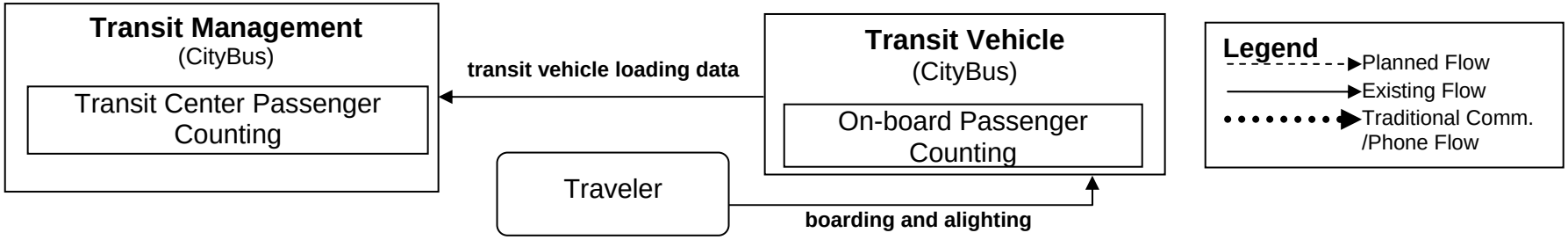
Principal Stakeholder: CityBus (Existing)

Data Dictionary:

Flow Name	National Architecture Flow Definition
boarding and alighting	Detection of transit passenger boarding and alighting. This flow represents the travelers' physical presence as they board a transit vehicle that can be detected or monitored by on-board sensors.
transit vehicle loading data	Data collected on board the transit vehicle relating to passenger boarding and alighting.

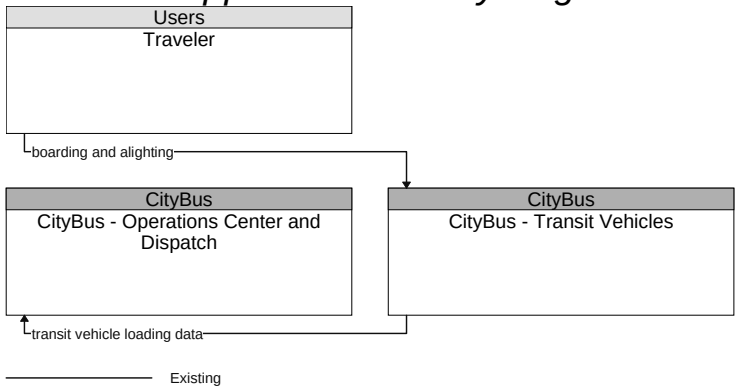
APTS10: Transit Passenger Counting

Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



APTS10: Transit Passenger Counting

Flow Diagram for the Tippecanoe County Regional ITS Architecture



ATIS1: Broadcast Traveler Information

Full Market Package Description:

This market package collects traffic conditions, advisories, general public transportation, toll and parking information, incident information, roadway maintenance and construction information, air quality and weather information, and broadly disseminates this information through existing infrastructures and low cost user equipment (e.g., FM sub carrier, cellular data broadcast). The information may be provided directly to travelers or provided to merchants and other traveler service providers so that they can better inform their customers of travel conditions. Different from the market package ATMS06 - Traffic Information Dissemination, which provides localized HAR and DMS information capabilities, ATIS1 provides a wide area digital broadcast service. Successful deployment of this market package relies on availability of real-time traveler information from roadway instrumentation, probe vehicles or other sources.

User Services Related to this Market Package:

1.1 Pre-trip Travel Information
1.2 En-route Driver Information

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Information Service Provider	**Basic Information Broadcast**	This equipment package collects, processes, stores, and disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. The same information is broadcast to all equipped traveler interface systems and vehicles.
	ISP Traveler Data Collection	This equipment package collects traveler-related data from other centers, consolidates, verifies, and refines the collected data, and makes this data available in a consistent format to applications that deliver traveler information. A broad range of traveler-related data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. This equipment package also shares data with other information service providers.
Personal Information Access	*Personal Basic Information Reception*	*This equipment package receives formatted traffic advisories, road conditions, transit information, broadcast alerts, an other general traveler information broadcasts and presents the information to the traveler. The traveler information broadcasts are received by personal devices including personal computers and personal portable devices such as personal digital assistants (PDAs) and pagers.*
Remote Traveler Support	*Remote Basic Information Reception*	*This equipment package receives formatted traffic advisories, road conditions, transit information, broadcast alerts, an other general traveler information broadcasts and presents the information to the traveler with a public traveler interface. This equipment package includes the receiver and public display device such as a kiosk, large-scale display monitor or other public display.*
Vehicle	*Basic Vehicle Reception*	*This equipment package provides the capability for drivers to receive basic transportation information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, weather information, and broadcast alerts.*

Customized ATIS1 Market Package Information for the Tippecanoe County ITS RA:

Principal Stakeholders:

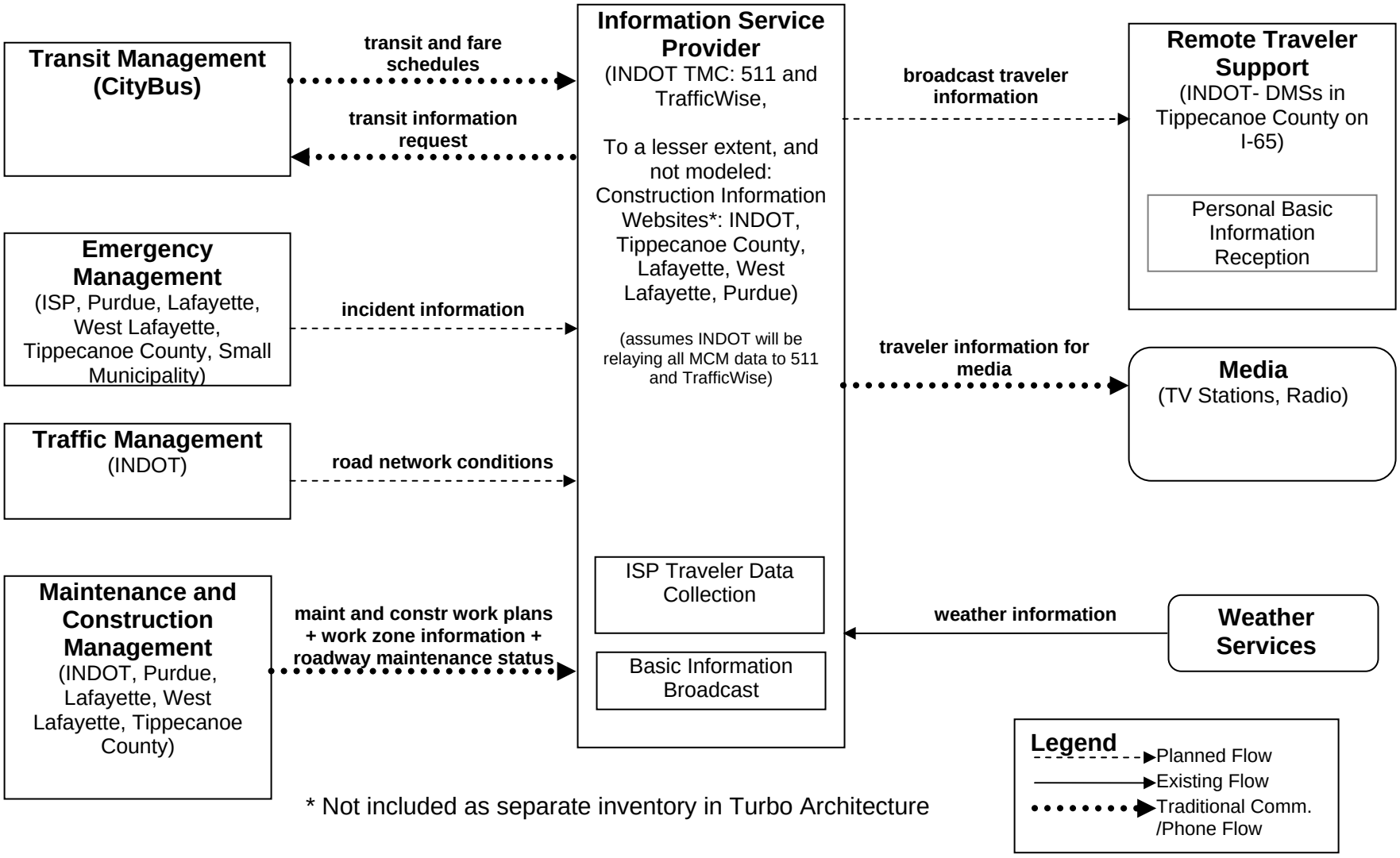
- INDOT (Planned)
- Construction Information Websites: INDOT, Lafayette, West Lafayette, Tippecanoe County, Purdue (Existing)

Data Dictionary:

Flow Name	National Architecture Flow Definition
broadcast traveler information	General broadcast information that contains link travel times, incidents, advisories, transit services and a myriad of other traveler information.
incident information	Notification of existence of incident and expected severity, location, time and nature of incident. As additional information is gathered and the incident evolves, updated incident information is provided. Incidents include any event that impacts transportation system operation ranging from routine incidents (e.g., disabled vehicle at the side of the road) through large-scale natural or human-caused disasters that involve loss of life, injuries, extensive property damage, and multi-jurisdictional response.
maint and constr work plans	Future construction and maintenance work schedules and activities including anticipated closures with anticipated impact to the roadway, alternate routes, anticipated delays, closure times, and durations.
road network conditions	Current and forecasted traffic information, road and weather conditions, traffic incident information, and other road network status. Raw data, processed data, or some combination of both may be provided by this architecture flow. Information on diversions and alternate routes, closures, and special traffic restrictions (lane/shoulder use, weight restrictions, width restrictions, HOV requirements) in effect is also included.
roadway maintenance status	Summary of maintenance fleet operations affecting the road network. This includes the status of winter maintenance (snow plow schedule and current status).
transit and fare schedules	Transit service information including routes, schedules, schedule adherence, and fare information. Includes transit service information during evacuation.
transit information request	Request for transit operations information including schedule and fare information. The request can be a subscription that initiates as-needed information updates as well as a one-time request for information.
traveler information for media	General traveler information regarding incidents, unusual traffic conditions, transit issues, or other advisory information that has been desensitized and provided to the media.
weather information	Accumulated forecasted and current weather data (e.g., temperature, pressure, wind speed, wind direction, humidity, precipitation, visibility, light conditions, etc.).
work zone information	Summary of maintenance and construction work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.

ATIS1: Broadcast Traveler Information

Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



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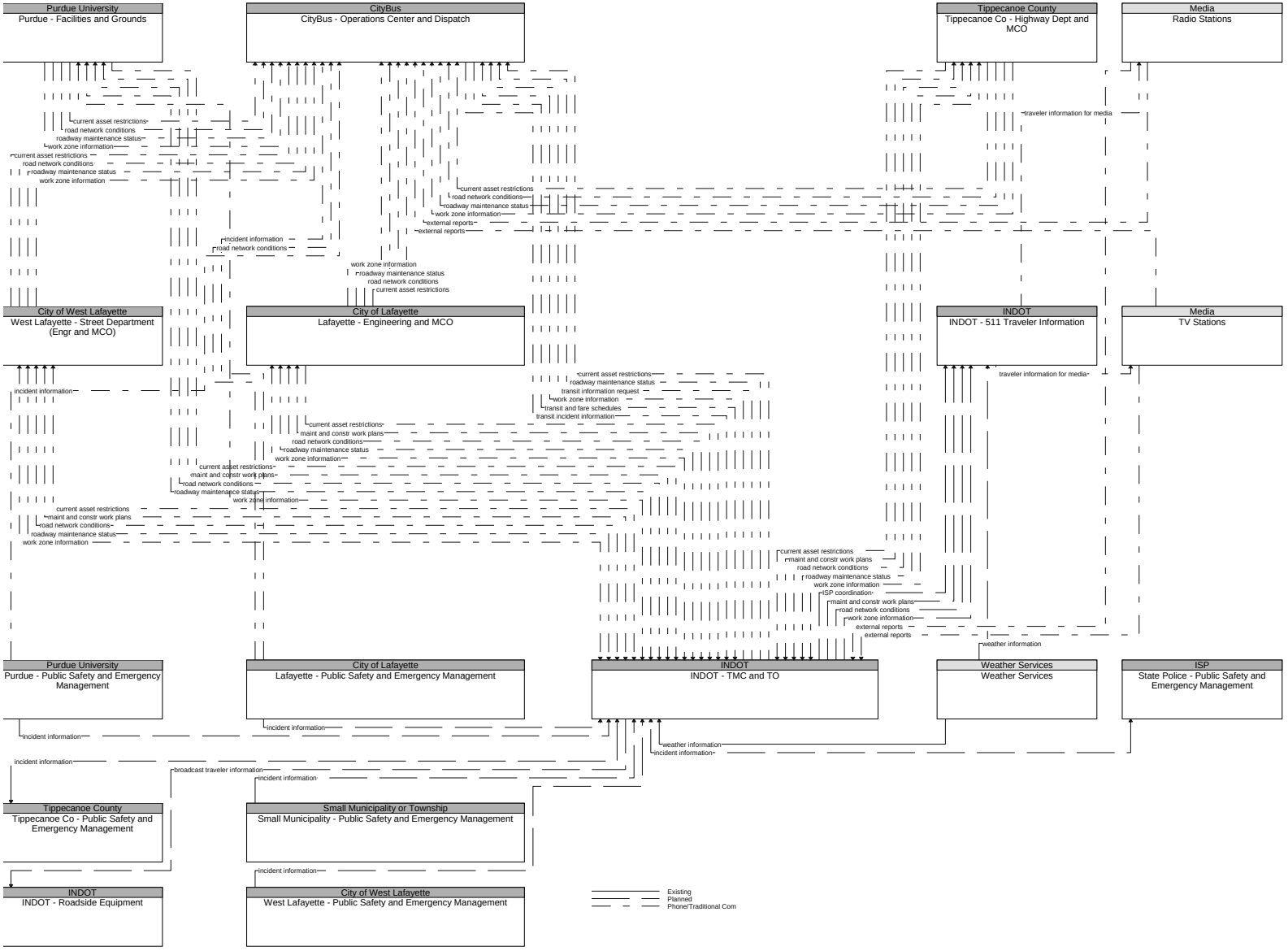
ATIS1: Broadcast Traveler Information

Flow Diagram for the Tippecanoe County Regional ITS Architecture



ATMS01: Network Surveillance

Full Market Package Description:

This market package includes traffic detectors, other surveillance equipment, the supporting field equipment, and fixed-point to fixed-point communications to transmit the collected data back to the Traffic Management Subsystem. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the Traffic Management Subsystem). The data generated by this market package enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users and the Information Service Provider Subsystem.

User Services Related to this Market Package:

1.6 Traffic Control
1.7 Incident Management

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Roadway Subsystem	**Roadway Basic Surveillance**	This equipment package monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.
	Roadway Equipment Coordination	This equipment package supports direct communications between field equipment. It includes field elements that control and send data to other field elements. This includes coordination between remote sensors and field devices (e.g., Dynamic Message Signs) and coordination between the field devices themselves (e.g., direct coordination between traffic controllers that are controlling adjacent intersections.).
Traffic Management	**Collect Traffic Surveillance**	This equipment package remotely monitors and controls traffic sensors and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. The collected information is provided to traffic operations personnel and made available to other centers.
	Traffic Maintenance	This equipment package monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Subsystem. The equipment package tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored by this equipment package including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).

Customized ATMS01 Market Package Information for the Tippecanoe County ITS RA:

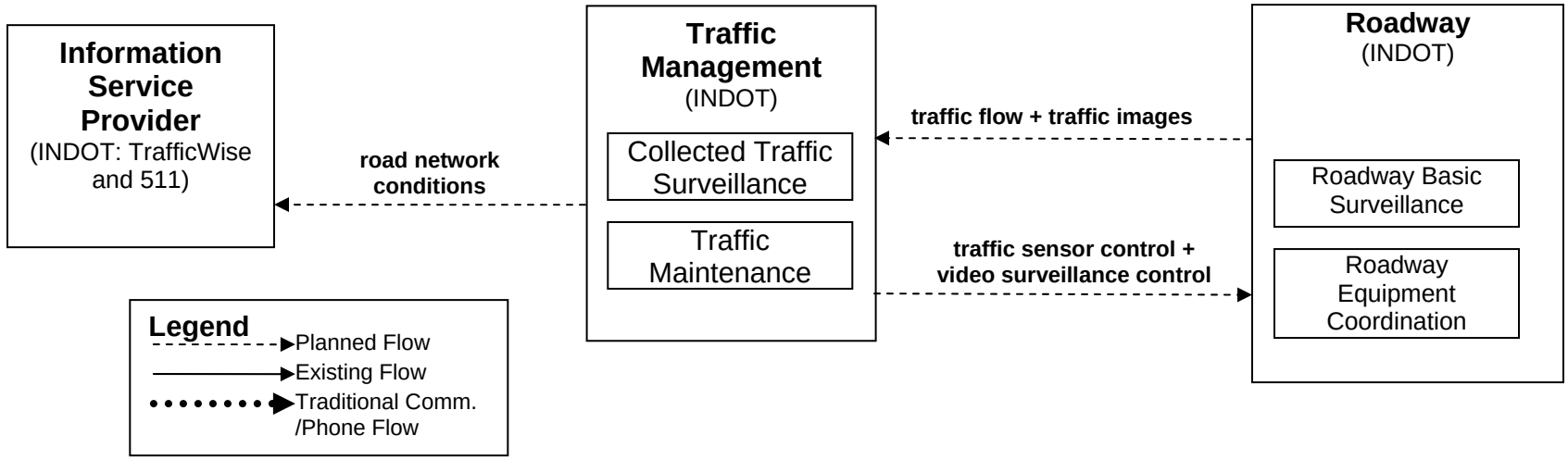
Principal Stakeholder: INDOT (Planned)

Data Dictionary:

Flow Name	National Architecture Flow Definition
road network conditions	Current and forecasted traffic information, road and weather conditions, traffic incident information, and other road network status. Raw data, processed data, or some combination of both may be provided by this architecture flow. Information on diversions and alternate routes, closures, and special traffic restrictions (lane/shoulder use, weight restrictions, width restrictions, HOV requirements) in effect is also included.
traffic flow	Raw and/or processed traffic detector data which allows derivation of traffic flow variables (e.g., speed, volume, and density measures) and associated information (e.g., congestion, potential incidents).
traffic images	High fidelity, real-time traffic images suitable for surveillance monitoring by the operator or for use in machine vision applications. This flow includes the images and the operational status of the surveillance system.
traffic sensor control	Information used to configure and control traffic sensor systems.
video surveillance control	Information used to configure and control video surveillance systems.

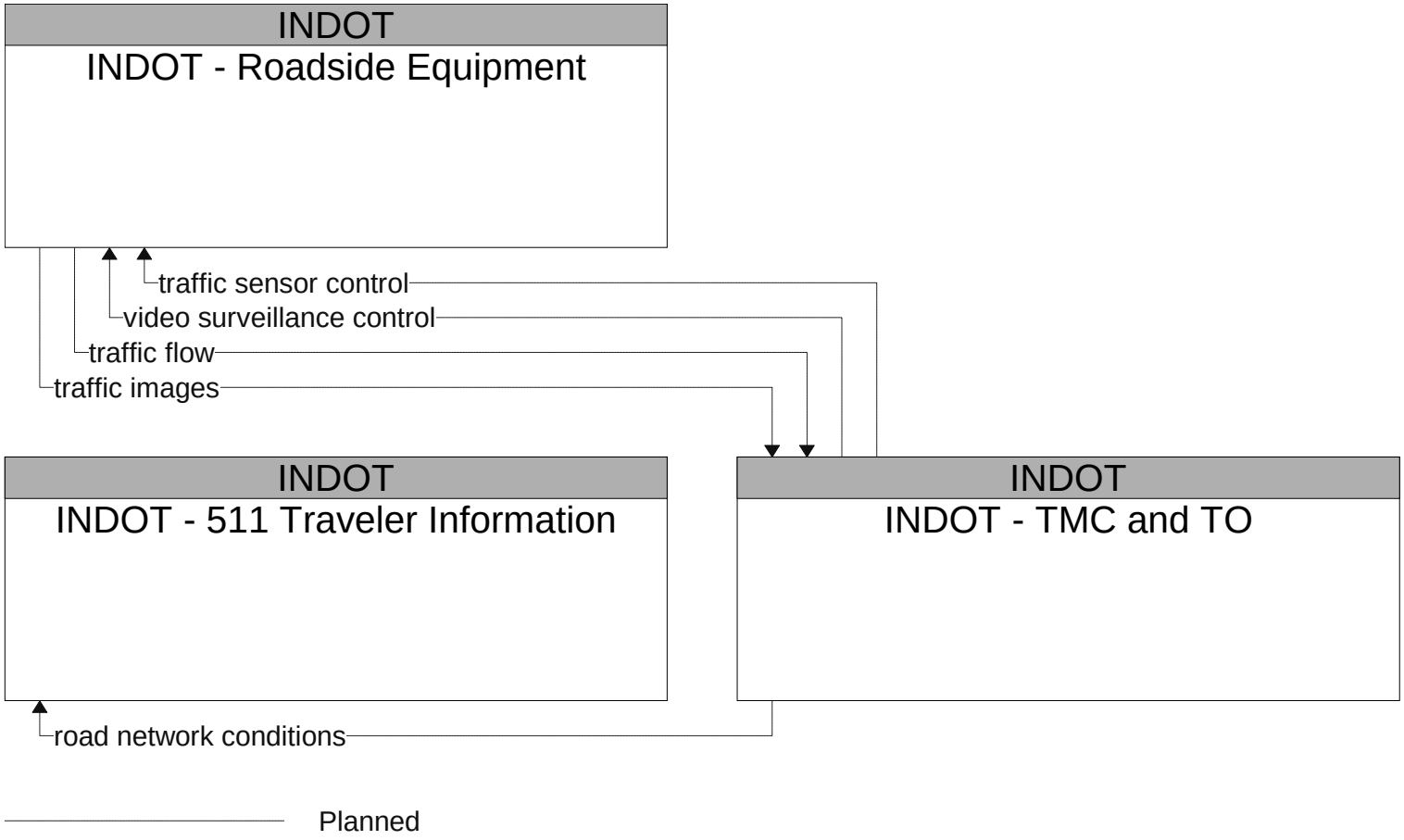
ATMS01: Network Surveillance

Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



ATMS01: Network Surveillance

Flow Diagram for the Tippecanoe County Regional ITS Architecture



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ATMS03: Surface Street Control

Full Market Package Description:

This market package provides the central control and monitoring equipment, communication links, and the signal control equipment that support local surface street control and/or arterial traffic management. A range of traffic signal control systems are represented by this market package ranging from fixed-schedule control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests. This market package is generally an intra-jurisdictional package that does not rely on real-time communications between separate control systems to achieve area-wide traffic signal coordination. Systems that achieve coordination across jurisdictions by using a common time base or other strategies that do not require real time coordination would be represented by this package. This market package is consistent with typical urban traffic signal control systems.

User Services Related to this Market Package:

1.10 Highway Rail Intersection
1.6 Traffic Control
1.7 Incident Management

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Roadway Subsystem	**Roadway Basic Surveillance**	This equipment package monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.
	Roadway Equipment Coordination	This equipment package supports direct communications between field equipment. It includes field elements that control and send data to other field elements. This includes coordination between remote sensors and field devices (e.g., Dynamic Message Signs) and coordination between the field devices themselves (e.g., direct coordination between traffic controllers that are controlling adjacent intersections.).
	Roadway Signal Controls	This equipment package includes the field elements that monitor and control signalized intersections. It includes the traffic signal controllers, signal heads, detectors, and other ancillary equipment that supports traffic signal control. It also includes field masters, and equipment that supports communications with a central monitoring and/or control system, as applicable. The communications link supports upload and download of signal timings and other parameters and reporting of current intersection status. This equipment package represents the field equipment used in all levels of traffic signal control from basic actuated systems that operate on fixed timing plans through adaptive systems. It also supports all signalized intersection configurations, including those that accommodate pedestrians.
Traffic Management	**Collect Traffic Surveillance**	This equipment package remotely monitors and controls traffic sensors and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. The collected information is provided to traffic operations personnel and made available to other centers.

Subsystem	Equipment Package	Description
	TMC Signal Control	This equipment package provides the capability for traffic managers to monitor and manage the traffic flow at signalized intersections. This capability includes analyzing and reducing the collected data from traffic surveillance equipment and developing and implementing control plans for signalized intersections. Control plans may be developed and implemented that coordinate signals at many intersections under the domain of a single traffic management subsystem and are responsive to traffic conditions and adapt to support incidents, preemption and priority requests, pedestrian crossing calls, etc.
	Traffic Maintenance	This equipment package monitors the operational status of field equipment and detects failures. It presents field equipmen status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Subsystem. The equipment package tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored by this equipment package including sensors (traffic, infrastructure, environmental, security, speed, etc. and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).

Customized ATMS03 Market Package Information for the Tippecanoe County ITS RA:

Principal Stakeholders:

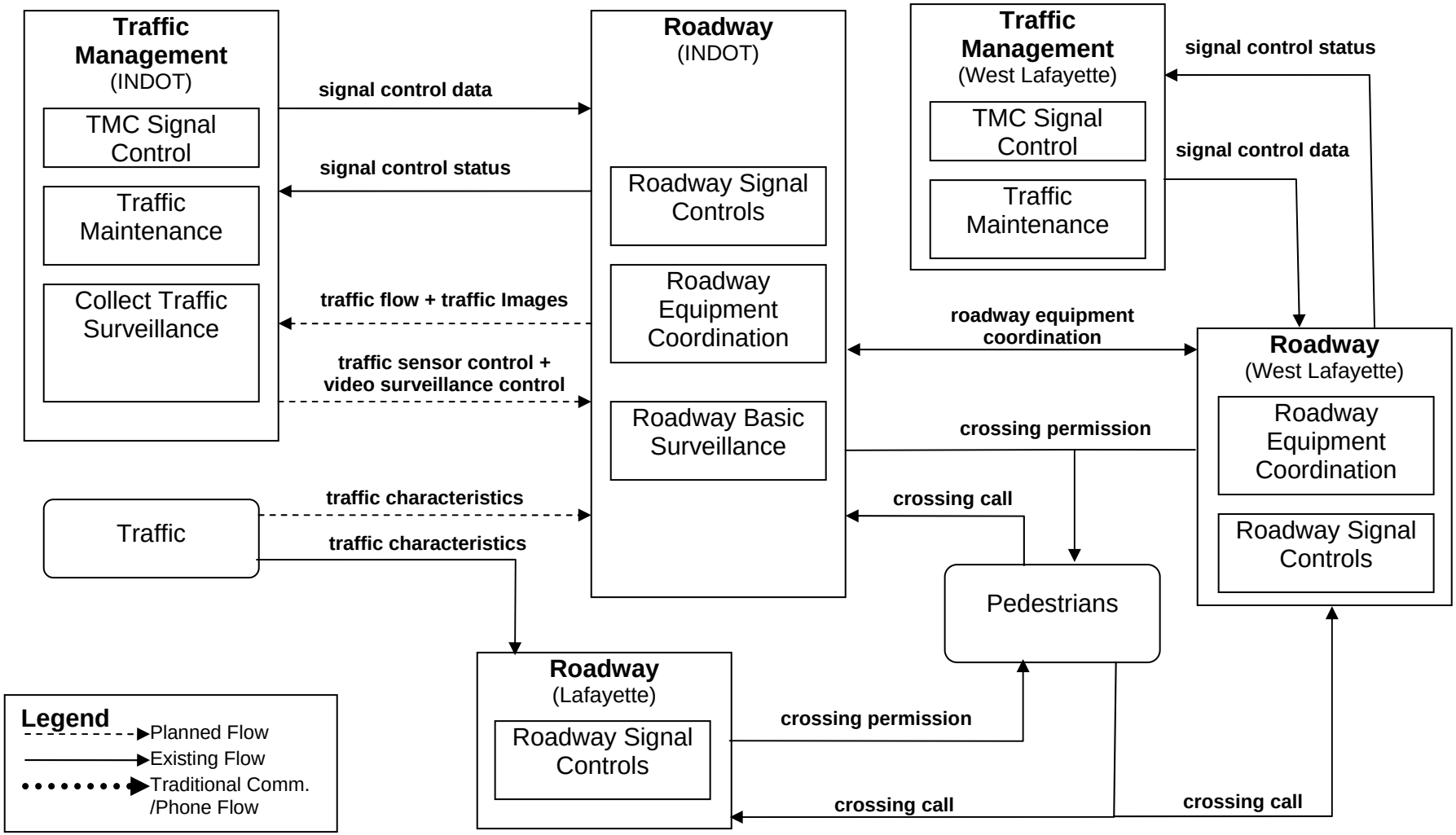
- INDOT (Existing and Planned)
- City of Lafayette (Existing)
- City of West Lafayette (Existing)

Data Dictionary:

Flow Name	National Architecture Flow Definition
crossing call	Request for pedestrian crossing.
crossing permission	Signal to pedestrians indicating permission to cross roadway.
roadway equipment coordination	The direct flow of information between field equipment. This includes transfer of information between sensors and driver information systems or control devices (traffic signals, ramp meters, etc.), direct coordination between adjacent control devices, Interfaces between detection and warning or alarm systems, and any other direct communications between field equipment. Both peer-to-peer and master-slave communications between field devices are covered by this flow.
signal control data	Information used to configure and control traffic signal systems.
signal control status	Status of surface street signal controls.
traffic characteristics	Physical traffic characteristics which are monitored and translated into macroscopic measures like occupancy, volume, density, and average speed. Point measures support presence detection and individual vehicle measures like speed.
traffic flow	Raw and/or processed traffic detector data which allows derivation of traffic flow variables (e.g., speed, volume, and density measures) and associated information (e.g., congestion, potential incidents).
traffic images	High fidelity, real-time traffic images suitable for surveillance monitoring by the operator or for use in machine vision applications. This flow includes the images and the operational status of the surveillance system.
traffic sensor control	Information used to configure and control traffic sensor systems.
video surveillance control	Information used to configure and control video surveillance systems.

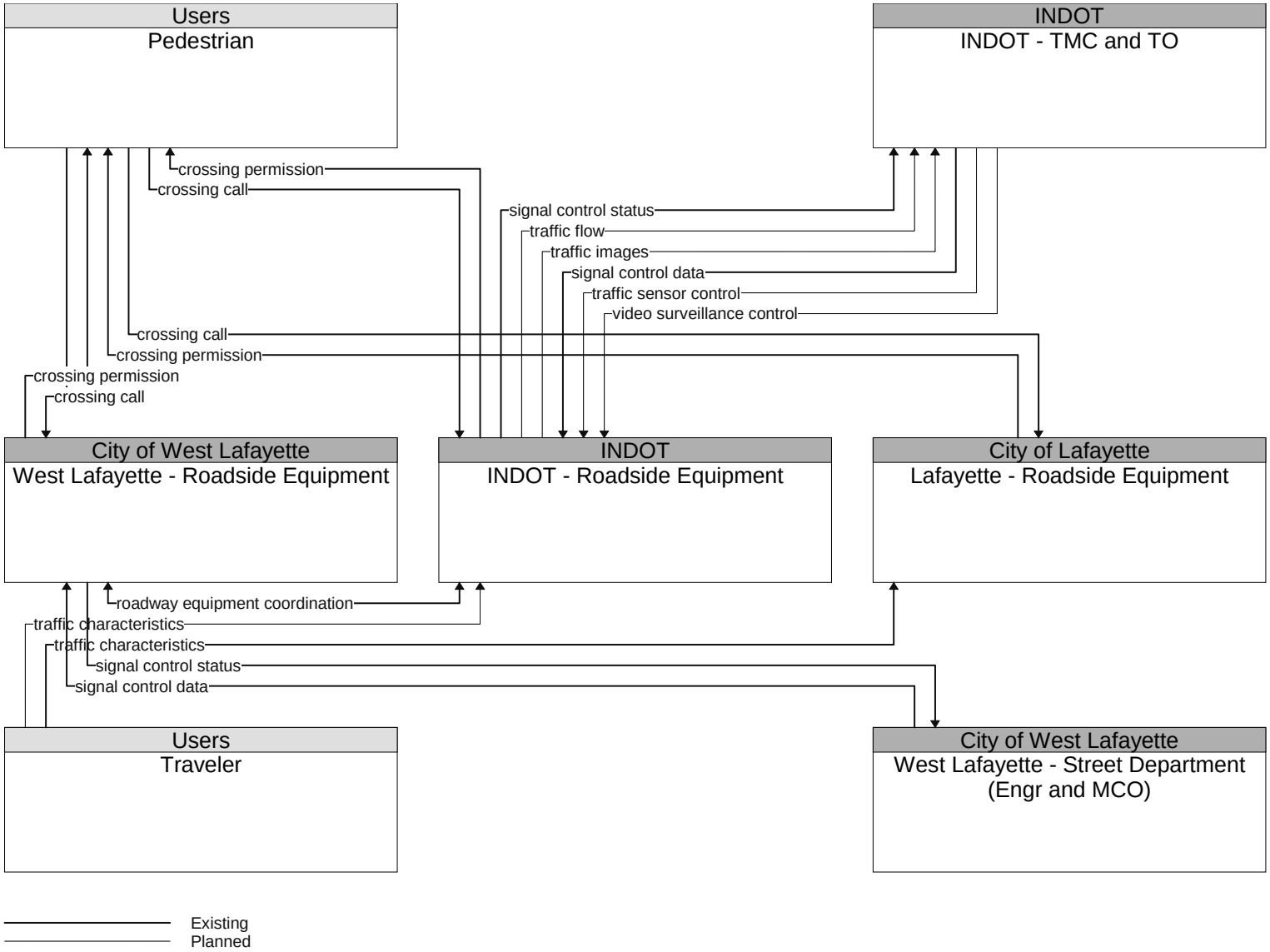
ATMS03: Surface Street Control

Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



ATMS03: Surface Street Control

Flow Diagram for the Tippecanoe County Regional ITS Architecture



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ATMS06: Traffic Information Dissemination

Full Market Package Description:

This market package provides driver information using roadway equipment such as dynamic message signs or highway advisory radio. A wide range of information can be disseminated including traffic and road conditions, closure and detour information, incident information, and emergency alerts and driver advisories. This package provides information to drivers at specific equipped locations on the road network. Careful placement of the roadway equipment provides the information at points in the network where the drivers have recourse and can tailor their routes to account for the new information. This package also covers the equipment and interfaces that provide traffic information from a traffic management center to the media (for instance via a direct tie-in between a traffic management center and radio or television station computer systems), Transit Management, Emergency Management, and Information Service Providers. A link to the Maintenance and Construction Management subsystem allows real time information on road/bridge closures due to maintenance and construction activities to be disseminated.

User Services Related to this Market Package:

1.2 En-route Driver Information
1.6 Traffic Control
1.7 Incident Management

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Roadway Subsystem	*Roadway Equipment Coordination*	*This equipment package supports direct communications between field equipment. It includes field elements that control and send data to other field elements. This includes coordination between remote sensors and field devices (e.g., Dynamic Message Signs) and coordination between the field devices themselves (e.g., direct coordination between traffic controllers that are controlling adjacent intersections.).*
	Roadway Traffic Information Dissemination	This equipment package includes field elements that provide information to drivers, including dynamic message signs and highway advisory radio.
Traffic Management	**TMC Traffic Information Dissemination**	This equipment package disseminates traffic and road conditions, closure and detour information, incident information, driver advisories, and other traffic-related data to other centers, the media, and driver information systems. It monitors and controls driver information system field equipment including dynamic message signs and highway advisory radio, managing dissemination of driver information through these systems.

Customized ATMS06 Market Package Information for the Tippecanoe County ITS RA:

Principal Stakeholders

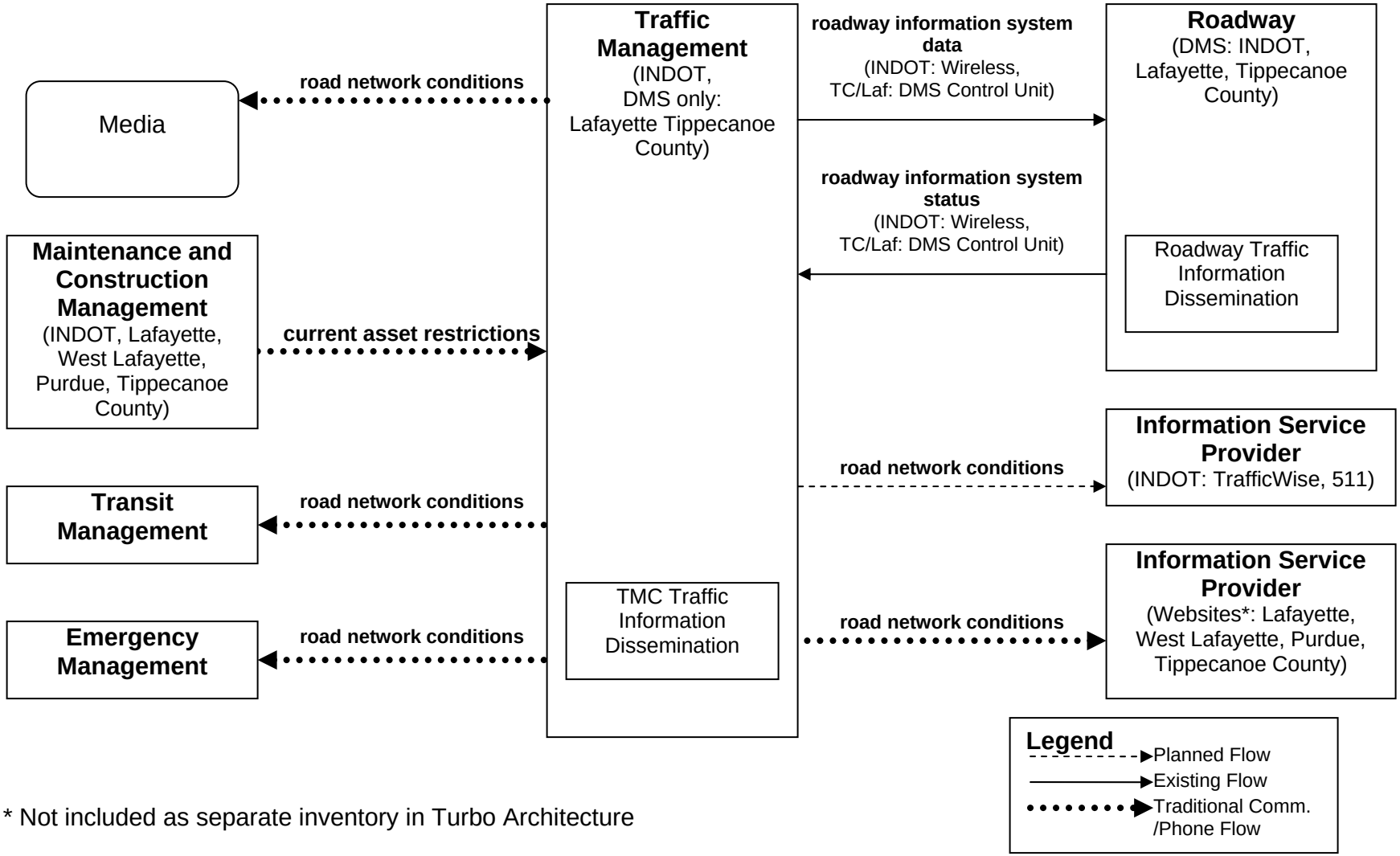
- INDOT (existing and planned)
- Lafayette (existing)
- Tippecanoe County (existing)

Data Dictionary:

Flow Name	National Architecture Flow Definition
current asset restrictions	Restrictions levied on transportation asset usage based on infrastructure design, surveys, tests, or analyses. This includes standard facility design height, width, and weight restrictions, special restrictions such as spring weight restrictions, and temporary facility restrictions that are imposed during maintenance and construction.
road network conditions	Current and forecasted traffic information, road and weather conditions, traffic incident information, and other road network status. Raw data, processed data, or some combination of both may be provided by this architecture flow. Information on diversions and alternate routes, closures, and special traffic restrictions (lane/shoulder use, weight restrictions, width restrictions, HOV requirements) in effect is also included.
roadway information system data	Information used to initialize, configure, and control roadside systems that provide driver information (e.g., dynamic message signs, highway advisory radio, beacon systems). This flow can provide message content and delivery attributes, local message store maintenance requests, control mode commands, status queries, and all other commands and associated parameters that support remote management of these systems.
roadway information system status	Current operating status of dynamic message signs, highway advisory radios, beacon systems, or other configurable field equipment that provides dynamic information to the driver.

ATMS06: Traffic Information Dissemination

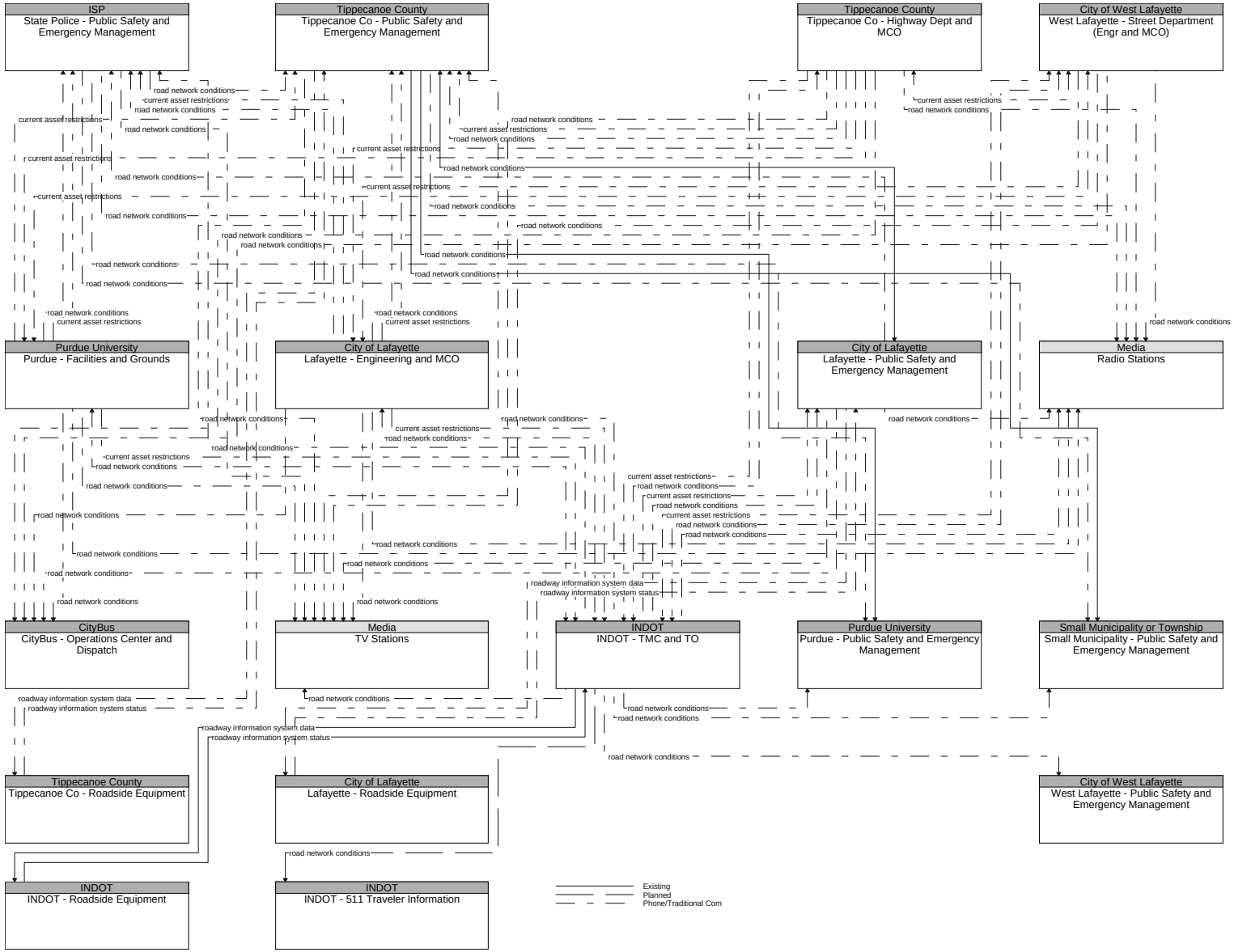
Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



* Not included as separate inventory in Turbo Architecture

ATMS06: Traffic Information Dissemination

Flow Diagram for the Tippecanoe County Regional ITS Architecture



ATMS08: Traffic Incident Management

Full Market Package Description:

This market package manages both unexpected incidents and planned events so that the impact to the transportation network and traveler safety is minimized. The market package includes incident detection capabilities through roadside surveillance devices (e.g. CCTV) and through regional coordination with other traffic management, maintenance and construction management and emergency management centers as well as rail operations and event promoters. Information from these diverse sources is collected and correlated by this market package to detect and verify incidents and implement an appropriate response. This market package supports traffic operations personnel in developing an appropriate response in coordination with emergency management, maintenance and construction management, and other incident response personnel to confirmed incidents. The response may include traffic control strategy modifications or resource coordination between center subsystems. Incident response also includes presentation of information to affected travelers using the Traffic Information Dissemination market package and dissemination of incident information to travelers through the Broadcast Traveler Information or Interactive Traveler Information market packages. The roadside equipment used to detect and verify incidents also allows the operator to monitor incident status as the response unfolds. The coordination with emergency management might be through a CAD system or through other communication with emergency field personnel. The coordination can also extend to tow trucks and other allied response agencies and field service personnel.

User Services Related to this Market Package:

1.7 Incident Management
5.2 Emergency Vehicle Management
5.3 Disaster Response and Evacuation

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Emergency Management	**Emergency Response Management**	This equipment package provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside th local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. This equipment package develops and stores emergency response plans and manages overall coordinated response to emergencies. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. This equipment package provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident.

Subsystem	Equipment Package	Description
	Incident Command	The equipment package provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. The equipment package supports communications with public safety emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. This equipment package supports the functions and interfaces commonly supported by a mobile command center.
Emergency Vehicle Subsystem	**On-board EV Incident Management Communication**	This on-board equipment package provides communications support to first responders. Information about the incident, information on dispatched resources, and ancillary information such as road and weather conditions are provided to emergency personnel. Emergency personnel transmit information about the incident such as identification of vehicles and people involved, the extent of injuries, hazardous material, resources on site, site management strategies in effect, and current clearance status.
Maintenance and Construction Management	**MCM Incident Management**	This equipment package supports maintenance and construction participation in coordinated incident respons Incident notifications are shared, incident response resources are managed, and the overall incident situation and incident response status is coordinated among allied response organizations.
Roadway Subsystem	**Roadway Equipment Coordination**	This equipment package supports direct communications between field equipment. It includes field elements that control and send data to other field elements. This includes coordination between remote sensors and fiel devices (e.g., Dynamic Message Signs) and coordination between the field devices themselves (e.g., direct coordination between traffic controllers that are controlling adjacent intersections.).
	Roadway Incident Detection	This equipment package provides incident detection using traffic detectors and surveillance equipment. It monitors for unusual traffic conditions that may indicate an incident or processes surveillance images, watchin for potential incidents. This equipment package provides potential incident information as well as traffic flow and images to the center for processing and presentation to traffic operations personnel.
Traffic Management	**TMC Incident Detection**	This equipment package identifies and reports incidents to Traffic Operations Personnel. It remotely monitors and controls traffic sensor and surveillance systems that support incident detection and verification. It analyze and reduces the collected sensor and surveillance data, external alerting and advisory and incident reporting systems, anticipated demand information from intermodal freight depots, special event information, and identifies and reports incidents and hazardous conditions
	TMC Incident Dispatch Coordination/ Communication	This equipment package formulates and manages an incident response that takes into account the incident al, incident impacts, and/or resources required for incident management including proposing and facilitating th h of emergency response and service vehicles as well as coordinating response with all appropriate ating agencies.

Customized ATMS08 Market Package Information for the Tippecanoe County ITS RA:

Principal Stakeholder: INDOT (Planned)

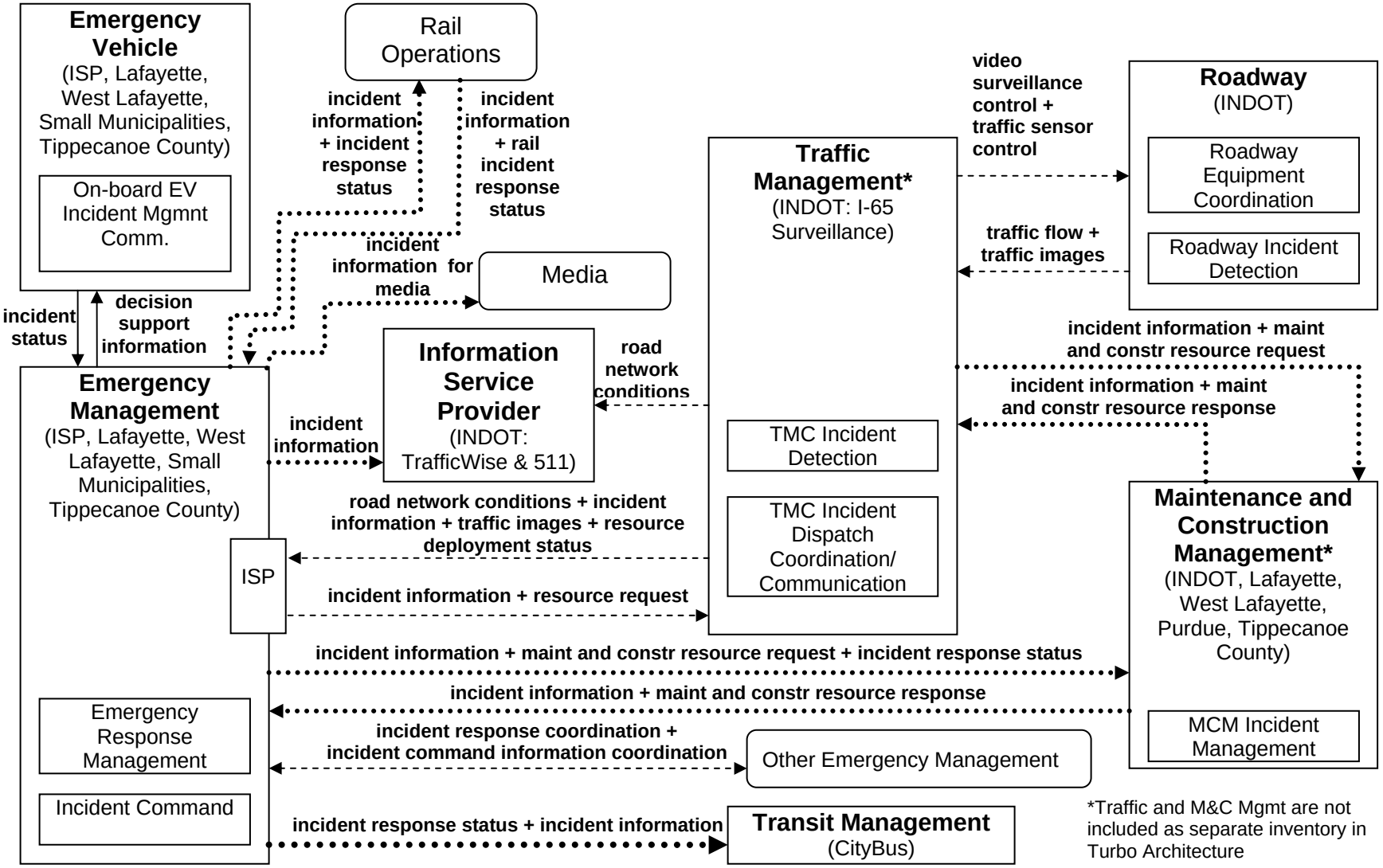
Data Dictionary:

Flow Name	National Architecture Flow Definition
decision support information	Information provided to support effective and safe incident response, including local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.
incident command information coordination	Information that supports local management of an incident. It includes resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response.
incident information	Notification of existence of incident and expected severity, location, time and nature of incident. As additional information is gathered and the incident evolves, updated incident information is provided. Incidents include any event that impacts transportation system operation ranging from routine incidents (e.g., disabled vehicle at the side of the road) through large-scale natural or human-caused disasters that involve loss of life, injuries, extensive property damage, and multi-jurisdictional response.
incident info for media	Report of current desensitized incident information prepared for public dissemination through the media.
incident response coordination	Incident response procedures and current incident response status that are shared between allied response agencies to support a coordinated response to incidents. This flow provides current situation information, including a summary of incident status and its impact on the transportation system and other infrastructure, and current and planned response activities. This flow also coordinates a positive hand off of responsibility for all or part of an incident response between agencies.
incident response status	Status of the current incident response including a summary of incident status and its impact on the transportation system, traffic management strategies implemented at the site (e.g., closures, diversions, traffic signal control overrides), and current and planned response activities.
incident status	Info gathered at the incident site that more completely characterizes the incident and provides current incident response status.
maint and constr resource request	Request for road maintenance and construction resources that can be used in the diversion of traffic (cones, portable signs), clearance of a road hazard, repair of ancillary damage, or any other incident response. The request may poll for resource availability or request pre-staging, staging, or immediate dispatch of resources.
maint and constr resource response	Current status of maintenance and construction resources including availability and deployment status. General resource inventory information covering vehicles, equipment, materials, and people and specific resource deployment status may be included.
rail incident response status	Status of the rail system's response to current incidents.

Flow Name	National Architecture Flow Definition
resource deployment status	Status of traffic management resource deployment identifying the resources available and their current status. General resource inventory information and specific status of deployed resources may be included.
resource request	A request for traffic management resources to implement special traffic control measures, assist in clean up, verify an incident, etc. The request may poll for resource availability or request pre-staging, staging, or immediate deployment of resources.
road network conditions	Current and forecasted traffic information, road and weather conditions, traffic incident information, and other road network status. Raw data, processed data, or some combination of both may be provided by this architecture flow. Information on diversions and alternate routes, closures, and special traffic restrictions (lane/shoulder use, weight restrictions, width restrictions, HOV requirements) in effect is also included.
traffic flow	Raw and/or processed traffic detector data which allows derivation of traffic flow variables (e.g., speed, volume, and density measures) and associated information (e.g., congestion, potential incidents).
traffic images	High fidelity, real-time traffic images suitable for surveillance monitoring by the operator or for use in machine vision applications. This flow includes the images and the operational status of the surveillance system.
traffic sensor control	Information used to configure and control traffic sensor systems.
video surveillance control	Information used to configure and control video surveillance systems.

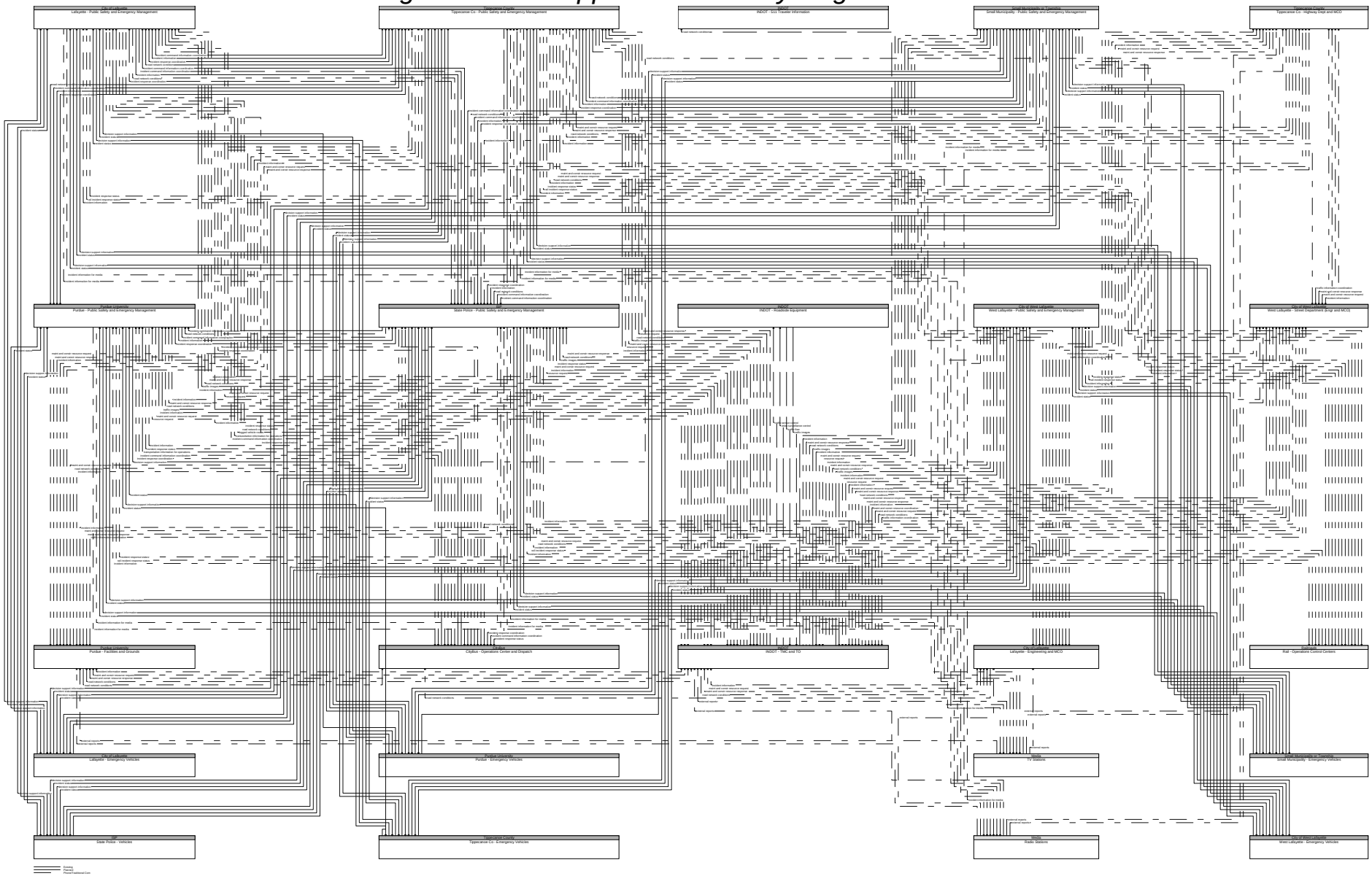
ATMS08: Traffic Incident Management

Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



ATMS08: Traffic Incident Management

Flow Diagram for the Tippecanoe County Regional ITS Architecture



ATMS13: Standard Railroad Grade Crossing

Full Market Package Description:

This market package manages highway traffic at highway-rail intersections (HRIs) where operational requirements do not dictate more advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Both passive (e.g., the crossbuck sign) and active warning systems (e.g., flashing lights and gates) are supported. (Note that passive systems exercise only the single interface between the roadway subsystem and the driver in the architecture definition.) These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification by interfaced wayside equipment of an approaching train. The equipment at the HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported to both highway and railroad officials through wayside interfaces and interfaces to the traffic management subsystem.

User Services Related to this Market Package: 1.10 Highway Rail Intersection

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Roadway Subsystem	**Standard Rail Crossing**	This equipment package manages highway traffic at highway-rail intersections (HRIs) where operational requirements do not dictate advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Either passive (e.g., th crossbuck sign) or active warning systems (e.g., flashing lights and gates) are supported depending on the specific requirements for each intersection. These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification of an approaching train by interfaced wayside equipment. The equipment at the HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces i performed; detected abnormalities are reported through interfaces to the wayside interface equipment and the traffic management subsystem.
Traffic Management	*HRI Traffic Management*	*This equipment package monitors and controls highway-rail intersection (HRI) equipment. Various levels of roadside equipment may be interfaced to this equipment package including standard speed active warning systems and high speed systems which provide additional information on approaching trains and detect and report obstructions in the HRI. This equipment package remotely monitors and reports the status of the HRI equipment and sends control plan updates to the HRI equipment.*

Customized ATMS13 Market Package Information for the Tippecanoe County ITS RA:

Principal Stakeholders:

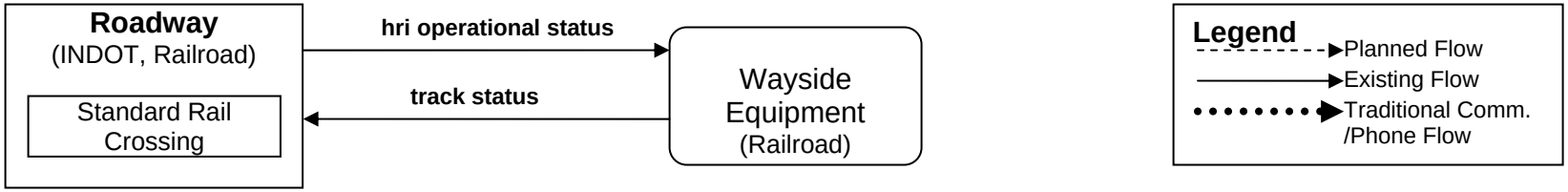
- INDOT (existing)
- Railroads (existing)

Data Dictionary:

Flow Name	National Architecture Flow Definition
hri operational status	Status of the highway-rail grade crossing equipment including both the current state or mode of operation and the current equipment condition.
track status	Current status of the wayside equipment and notification of an arriving train.

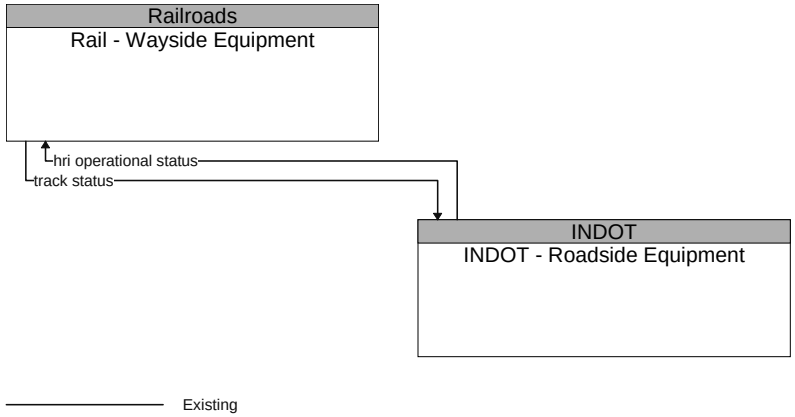
ATMS13: Standard Railroad Grade Crossing

Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



ATMS13: Standard Railroad Grade Crossing

Flow Diagram for the Tippecanoe County Regional ITS Architecture



ATMS19: Speed Monitoring

Full Market Package Description:

This market package monitors the speeds of vehicles traveling through a roadway system. If the speed is determine to be excessive, roadside equipment can suggest a safe driving speed. Environmental conditions may be monitored and factored into the safe speed advisories that are provided to the motorist. This service can also support notifications to an enforcement agency to enforce the speed limit on a roadway system.

User Services Related to this Market Package:

1.6 Traffic Control
8.1 Maintenance And Construction Operations

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Maintenance and Construction Management	*MCM Speed Monitoring*	*This equipment package remotely monitors and controls devices that monitor vehicle speeds and optionally provide safe speed advisories to the motorist. If excessive speeds are detected, this equipment package also includes the capability to notify an enforcement agency and request traffic enforcement in work zones or other areas where excessive speeds are identified.*
Roadway Subsystem	**Roadway Equipment Coordination**	This equipment package supports direct communications between field equipment. It includes field elements that control and send data to other field elements. This includes coordination between remote sensors and field devices (e.g., Dynamic Message Signs) and coordination between the field devices themselves (e.g., direct coordination between traffic controllers that are controlling adjacent intersections.).
	Roadway Speed Monitoring	This equipment package includes the field elements that monitor vehicle speeds. If the speed is determined to be excessive, then roadside equipment can suggest a safe driving speed. Environmental conditions may be monitored and factored into the safe speed advisories that are provided to the motorist. The operational status (state of the device, configuration, and fault data) is provided to the center. This equipment package can also provide an enforcement function, reporting speed violations to an enforcement agency.
Traffic Management	**TMC Speed Monitoring**	This equipment package remotely monitors and controls speed monitoring and speed warning systems. It remotely monitors vehicle speeds and presents this information to traffic operations personnel. It configures and controls the speed monitoring and warning equipment that provides safe speed advisories to the motorist. This equipment package can also notify an enforcement agency if excessive speeds are identified.

Customized ATMS19 Market Package Information for the Tippecanoe County ITS RA:

Principal Stakeholders:

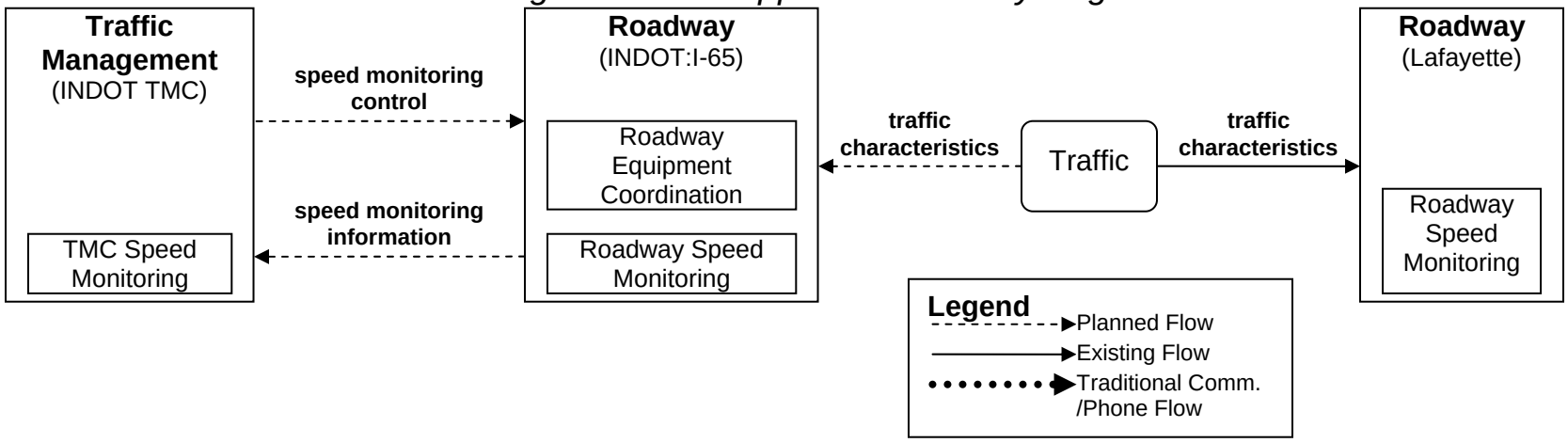
- INDOT (planned)
- Lafayette (existing)

Data Dictionary:

Flow Name	National Architecture Flow Definition
speed monitoring control	Information used to configure and control automated speed monitoring, speed warning, and speed enforcement systems.
speed monitoring information	System status including current operational state and logged information including measured speeds, warning messages displayed, and violation records.
traffic characteristics	Physical traffic characteristics which are monitored and translated into macroscopic measures like occupancy, volume, density, and average speed. Point measures support presence detection and individual vehicle measures like speed.

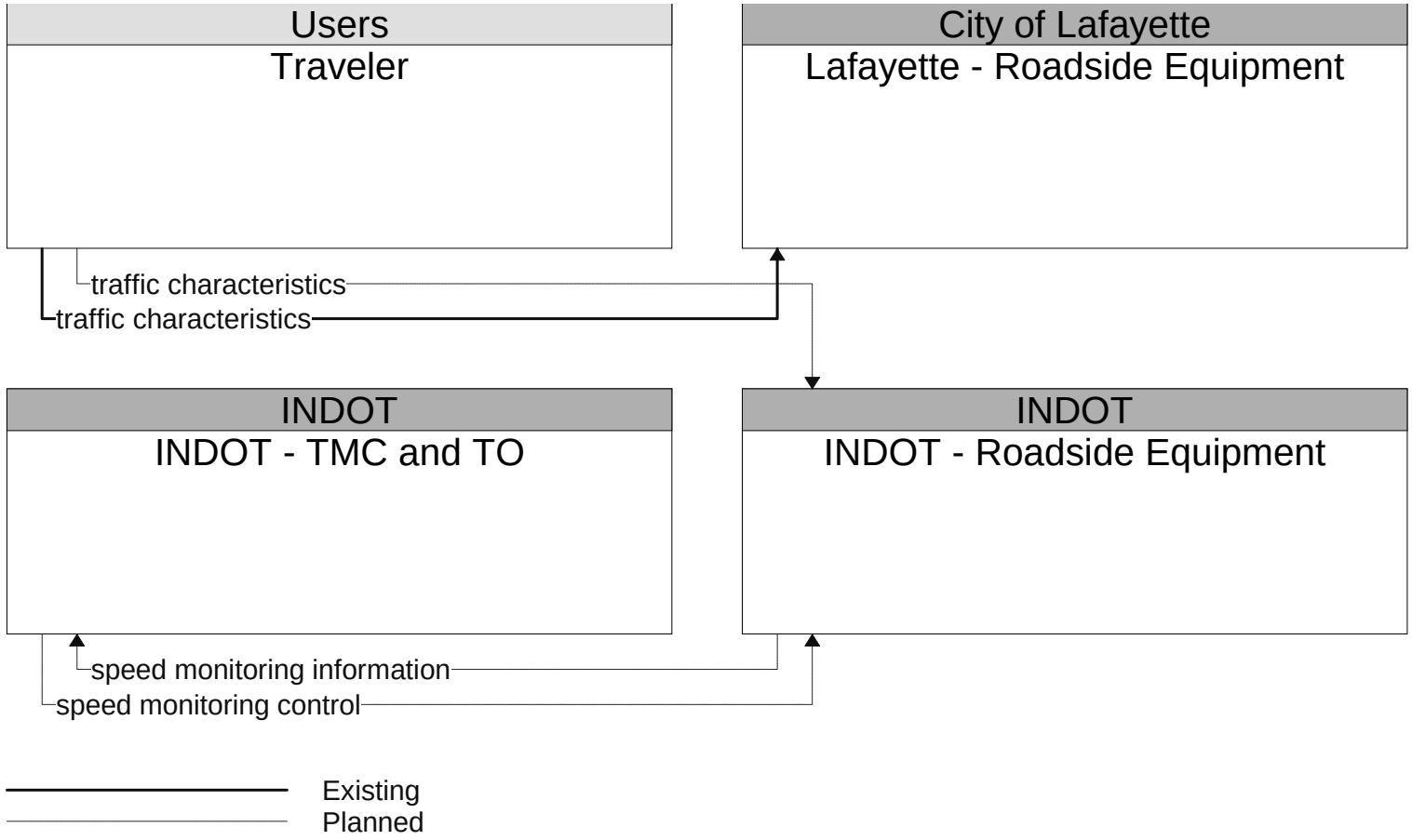
ATMS19: Speed Monitoring

Customized Market Diagram for the Tippecanoe County Regional ITS Architecture



ATMS19: Speed Monitoring

Flow Diagram for the Tippecanoe County Regional ITS Architecture



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EM01: Emergency Call Taking and Dispatch

Full Market Package Description:

This market package provides basic public safety call-taking and dispatch services. It includes emergency vehicle equipment, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. Coordination between Emergency Management Subsystems supports emergency notification between agencies. Wide area wireless communications between the Emergency Management Subsystem and an Emergency Vehicle supports dispatch and provision of information to responding personnel.

User Services Related to this Market Package:

4.5 Hazardous Material Security and Incident Response
5.2 Emergency Vehicle Management

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Emergency Management	**Emergency Call-Taking**	This equipment package supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other equipment packages that formulate and manage the emergency response. This equipment package receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.
	Emergency Dispatch	This equipment package tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies (see the Emergency Call-Taking equipment package) and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.
Emergency Vehicle	**On-board EV En Route Support**	This on-board equipment package supports dispatch, routing, and tracking of an emergency vehicle. Dispatch and routing information are received and presented to the driver and vehicle location and status are tracked and provided back to the dispatcher. This equipment package supports traffic signal preemption via short range communication directly with signal control equipment. It also supports communications with care facilities, sharing patient status and care facility status between the en route emergency vehicle and the care facility.

Customized EM01 Market Package Information for the Tippecanoe County ITS RA:

Principal Stakeholders:

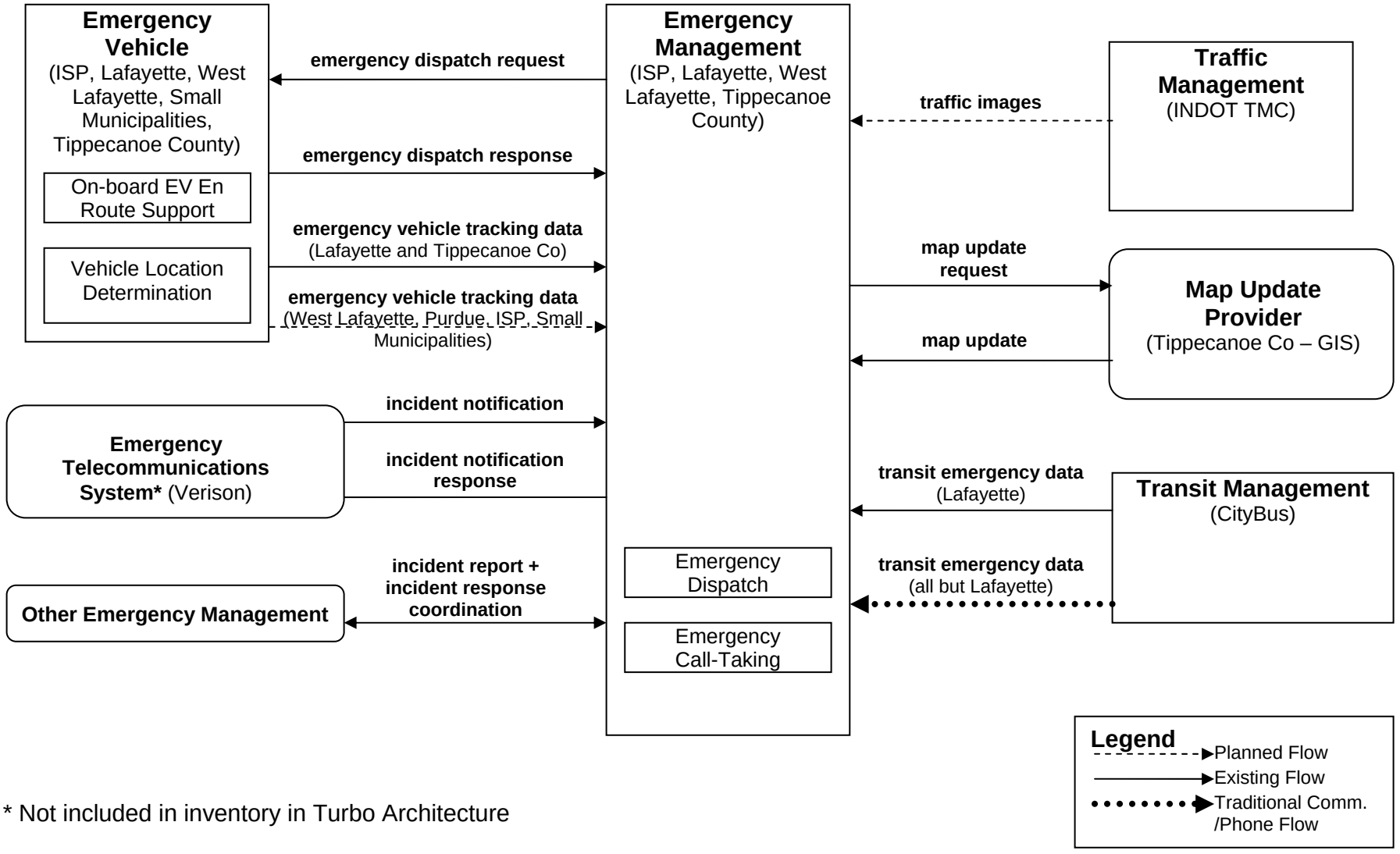
- Lafayette (existing)
- West Lafayette (existing)
- Purdue University (existing)
- Tippecanoe County (existing)
- Indiana State Police (existing)

Data Dictionary:

Flow Name	National Architecture Flow Definition
emergency dispatch requests	Emergency vehicle dispatch instructions including incident location and available information concerning the incident.
emergency dispatch requests	Emergency vehicle dispatch instructions including incident location and available information concerning the incident.
emergency dispatch response	Request for additional emergency dispatch information (e.g., a suggested route) and provision of en route status.
emergency dispatch response	Request for additional emergency dispatch information (e.g., a suggested route) and provision of en route status.
emergency vehicle tracking data	The current location and operating status of the emergency vehicle.
incident notification	The notification of an incident including its nature, severity, and location.
incident notification response	Interactive acknowledgement and verification of the incident information received, requests for additional information, and general information on incident response status.
incident report	Report of an identified incident including incident location, type, severity and other information necessary to initiate an appropriate incident response.
incident response coordination	Incident response procedures and current incident response status that are shared between allied response agencies to support a coordinated response to incidents. This flow provides current situation information, including a summary of incident status and its impact on the transportation system and other infrastructure, and current and planned response activities. This flow also coordinates a positive hand off of responsibility for all or part of an incident response between agencies.
map update request	Request for a map update which could include a new underlying map or map layer updates.
map updates	Map update which could include a new underlying static or real-time map or map layer(s) update.
traffic images	High fidelity, real-time traffic images suitable for surveillance monitoring by the operator or for use in machine vision applications. This flow includes the images and the operational status of the surveillance system.
transit emergency data	Initial notification of transit emergency at a transit stop or on transit vehicles and further coordination as additional details become available and the response is coordinated.

EM01: Emergency Call Taking and Dispatch

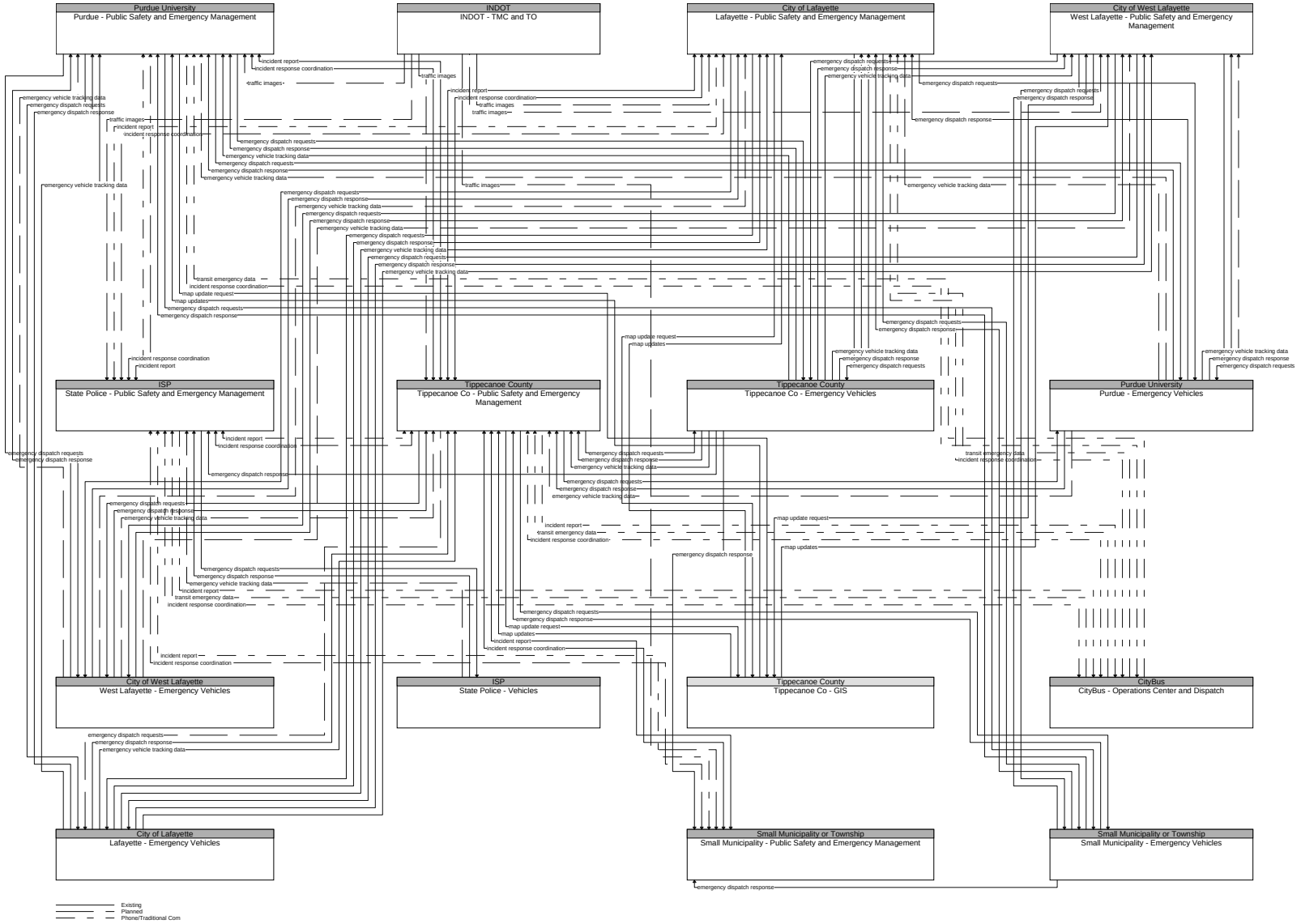
Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



* Not included in inventory in Turbo Architecture

EM01: Emergency Call Taking and Dispatch

Flow Diagram for the Tippecanoe County Regional ITS Architecture



EM06: Wide-Area Alert

Full Market Package Description:

This market package uses ITS driver and traveler information systems to alert the public in emergency situations such as child abductions, severe weather events, civil emergencies, and other situations that pose a threat to life and property. The alert includes information and instructions for transportation system operators and the traveling public, improving public safety and enlisting the public's help in some scenarios. The ITS technologies will supplement and support other emergency and homeland security alert systems such as the Emergency Alert System (EAS). When an emergency situation is reported and verified and the terms and conditions for system activation are satisfied, a designated agency broadcasts emergency information to traffic agencies, transit agencies, information service providers, toll operators, and others that operate ITS systems. The ITS systems, in turn, provide the alert information to transportation system operators and the traveling public using ITS technologies such as dynamic message signs, highway advisory radios, in-vehicle displays, transit displays, 511 traveler information systems, and traveler information web sites.

User Services Related to this Market Package: 5.1 Emergency Notification and Personal Security

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Emergency Management	**Emergency Early Warning System**	This equipment package monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to other equipment packages that provide the emergency response, including public notification using ITS traveler information systems, where appropriate.
Information Service Provider	**ISP Emergency Traveler Information**	This equipment package collects and provides emergency information to the public, including wide-area alerts and evacuation information. It provides emergency alerts, information on evacuation zones and evacuation requirements, evacuation destinations and shelter information, available transportation modes, and traffic and road conditions at the origin, destination, and along the evacuation routes. In addition to general evacuation information, personalized information including tailored evacuation routes, service information, and estimated travel times is also provided based on traveler specified origin, destination, and route parameters. Updated information is provided throughout the evacuation and subsequent reentry as status changes and plans are adapted.
	ISP Traveler Data Collection	This equipment package collects traveler-related data from other centers, consolidates, verifies, and refines the collected data, and makes this data available in a consistent format to applications that deliver traveler information. A broad range of traveler-related data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. This equipment package also shares data with other information service providers.

Subsystem	Equipment Package	Description
	Traveler Telephone Information	This equipment package services voice-based traveler requests for information that supports traveler telephone information systems like 511. The equipment package takes requests for traveler information, which could be voice-formatted traveler requests, dual-tone multifrequency (DTMF)-based requests, or a simple traveler information request, and returns the requested traveler information in the proper format. In addition to servicing requests for traveler information, this equipment package also collects and forwards alerts and advisories to traveler telephone information systems.
Maint. and Constr. Management	**MCM Incident Management**	This equipment package supports maintenance and construction participation in coordinated incident response. Incident notifications are shared, incident response resources are managed, and the overall incident situation and incident response status is coordinated among allied response organizations.
Personal Information Access	*Personal Basic Information Reception*	*This equipment package receives formatted traffic advisories, road conditions, transit information, broadcast alerts, and other general traveler information broadcasts and presents the information to the traveler. The traveler information broadcasts are received by personal devices including personal computers and personal portable devices such as personal digital assistants (PDAs) and pagers.*
Roadway Subsystem	**Roadway Traffic Information Dissemination**	This equipment package includes field elements that provides information to drivers, including dynamic message signs and highway advisory radio.
Remote Traveler Support	*Remote Basic Information Reception*	*This equipment package furnishes transit users with real-time travel-related information at transit stops, multi-modal transfer points, and other public transportation areas. It provides transit users with information on transit routes, schedules, transfer options, available services, fares, and real-time schedule adherence. In addition to tailored information for individual transit users, this equipment package supports general annunciation and/or display of imminent arrival information and other information of general interest to transit users.*
Remote Traveler Support	*Remote Transit Information Services*	*This equipment package provides wide-area alerts (safety/security broadcasts, child abductions, etc.) to toll operators. It provides the capability to monitor for active alerts and presents these alerts to administrative staff (the "Toll Administrator") and forwards these alerts to toll operators at the toll plazas/toll collection facilities. The Toll Administrator determines which alerts should be forwarded to toll operators and can inject alerts that are identified through other means.*
Toll Administration	*Toll Operator Alert*	*This equipment package provides wide-area alerts (safety/security broadcasts, child abductions, etc.) to toll operators. It provides the capability to monitor for active alerts and presents these alerts to administrative staff (the "Toll Administrator") and forwards these alerts to toll operators at the toll plazas/toll collection facilities. The Toll Administrator determines which alerts should be forwarded to toll operators and can inject alerts that are identified through other means.*
Toll Collection	*Toll Plaza Toll Collection*	*This equipment package provides toll plazas the capability to identify properly equipped vehicles, collect electronic tolls, and provide a positive indication to the driver that a toll was collected. Violators are identified and images are collected. Toll transactions are stored and reported to the Toll Administration Subsystem.*

Subsystem	Equipment Package	Description
Traffic Management	**TMC Incident Dispatch Coordination/Communication**	This equipment package formulates and manages an incident response that takes into account the incident potential, incident impacts, and/or resources required for incident management including proposing and facilitating the dispatch of emergency response and service vehicles as well as coordinating response with all appropriate cooperating agencies.
	TMC Traffic Information Dissemination	This equipment package disseminates traffic and road conditions, closure and detour information, incident information, driver advisories, and other traffic-related data to other centers, the media, and driver information systems. It monitors and controls driver information system field equipment including dynamic message signs and highway advisory radio, managing dissemination of driver information through these systems.
Transit Management	**Transit Center Information Services**	This equipment package collects the latest available information for a transit service and makes it available to transit customers and to Information Service Providers for further distribution. Customers are provided information at transit stops and other public transportation areas before they embark and on-board the transit vehicle once they are enroute. Information provided can include the latest available information on transit routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, yellow pages, and special events. In addition to general service information, tailored information (e.g., itineraries) are provided to individual transit users.
	Transit Center Security	This equipment package monitors transit vehicle operator or traveler activated alarms received from on-board a transit vehicle. It supports transit vehicle operator authentication and provides the capability to remotely disable a transit vehicle. This equipment package also includes the capability to alert operators and police to potential incidents identified by these security features.
Vehicle	*Basic Vehicle Reception*	*This equipment package provides the capability for drivers to receive basic transportation information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, weather information, and broadcast alerts.*

Customized EM06 Market Package Information for the Tippecanoe County ITS RA:

Principal Stakeholders:

- INDOT (existing: DMS and planned: 511 and TrafficWise)
- Tippecanoe County (existing: TEMA DMS)
- Lafayette (existing: LPD DMS)
- ISP (existing)
-

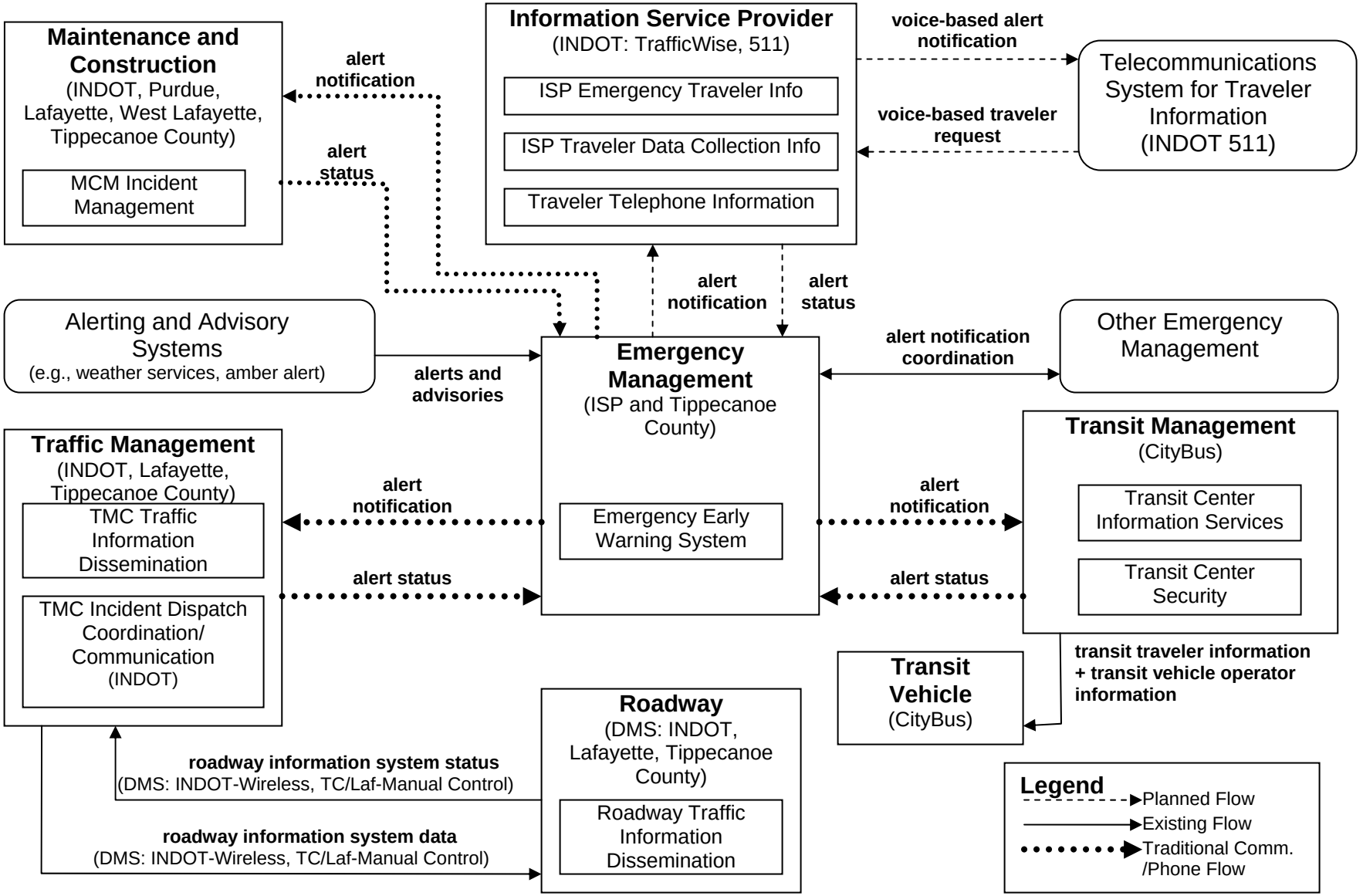
Data Dictionary:

Flow Name	National Architecture Flow Definition
alert notification	Notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public. The flow identifies the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, and information and instructions necessary for the public to respond to the alert. This flow may also identify specific information that should not be released to the public.
alert notification coordination	Coordination of emergency alerts to be distributed to the public. This includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public and status of the public notification.
alert status	Information indicating the current status of the emergency alert including identification of the traveler and driver information systems that are being used to provide the alert.
alerts and advisories	Assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), and alerts (information on imminent or in-progress emergencies). This flow also provides supporting descriptive detail on incidents, threats, and vulnerabilities to increase preparedness and support effective response to threats against the surface transportation system.
roadway information system data	Information used to initialize, configure, and control roadside systems that provide driver information (e.g., dynamic message signs, highway advisory radio, beacon systems). This flow can provide message content and delivery attributes, local message store maintenance requests, control mode commands, status queries, and all other commands and associated parameters that support remote management of these systems.
roadway info system status	Current operating status of dynamic message signs, highway advisory radios, beacon systems, or other configurable field equipment that provides dynamic information to the driver.
transit traveler information	Transit information prepared to support transit users and other travelers. It contains transit schedules, real-time arrival information, fare schedules, alerts and advisories, and general transit service information.
transit vehicle operator info	Transit service instructions, wide area alerts, traffic information, road conditions, and other information for both transit and paratransit operators.

Flow Name	National Architecture Flow Definition
voice-based alert notification	Information to be distributed to the traveling public via voice regarding a major emergency such as a natural or man-made disaster, civil emergency, severe weather or child abduction. The flow may identify the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, and information and instructions necessary for the public to respond to the alert. The content of this architecture flow may be specially formatted for voice-based traveler information.
voice-based traveler request	The electronic traveler information request from the telecommunications systems for traveler information terminator. It may be specifically formatted for voice-based traveler requests. The request can be a general subscription intended to initiate a continuous or regular data stream or a specific request intended to initiate a one-time response from the recipient.

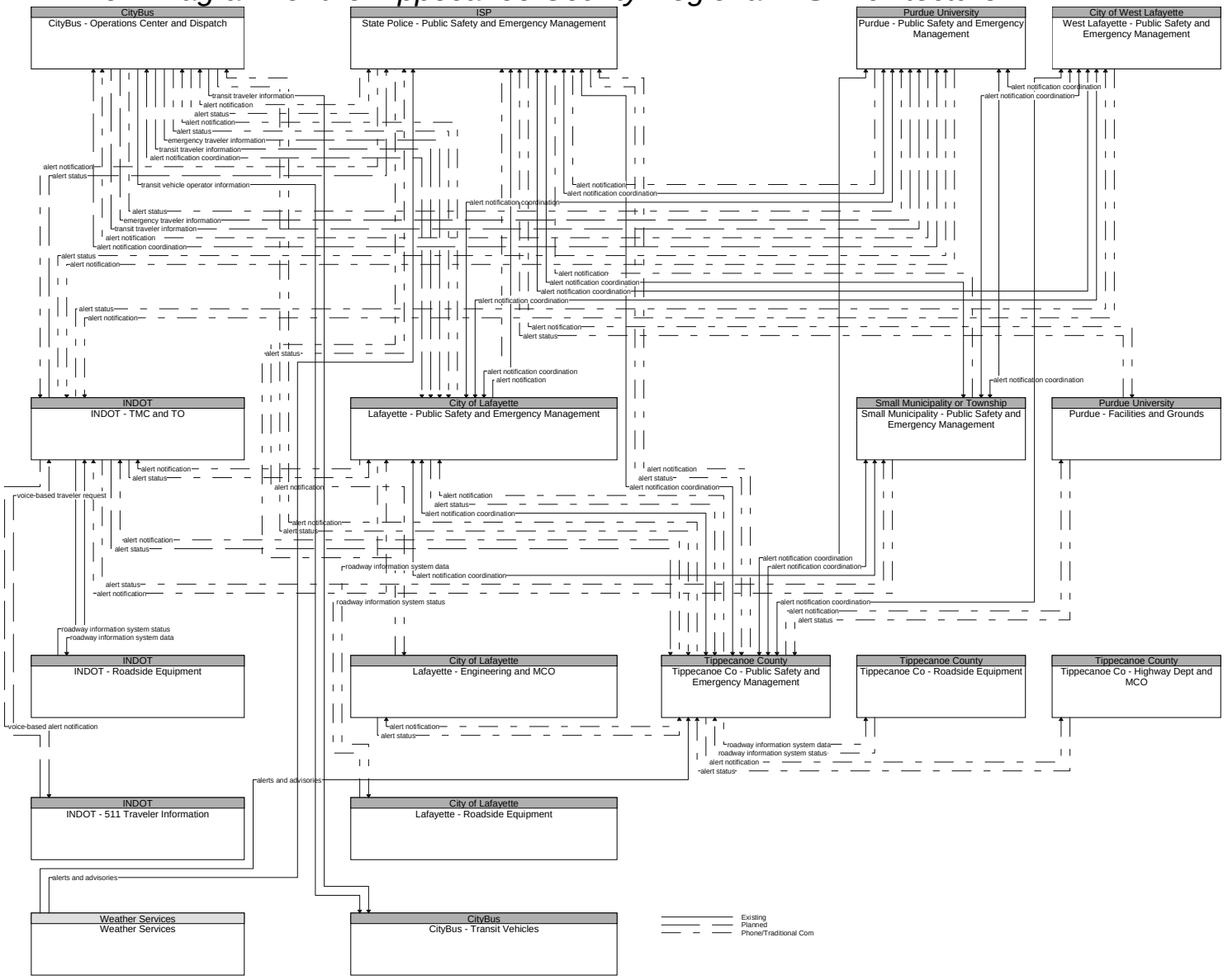
EM06: Wide-Area Alert

Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



EM06: Wide-Area Alert

Flow Diagram for the Tippecanoe County Regional ITS Architecture



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EM07: Early Warning System

Full Market Package Description:

This market package monitors and detects potential, looming, and actual disasters including natural disasters (hurricanes, earthquakes, floods, winter storms, tsunamis, etc.) and technological and man-made disasters (hazardous materials incidents, nuclear power plant accidents, and acts of terrorism including nuclear, chemical, biological, and radiological weapons attacks). The market package monitors alerting and advisory systems, ITS sensors and surveillance systems, field reports, and emergency call-taking systems to identify emergencies and notifies all responding agencies of detected emergencies.

User Services Related to this Market Package: 5.3 Disaster Response And Evacuation

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Emergency Management	*Center Secure Area Sensor Management*	*This equipment package manages sensors that monitor secure areas in the transportation system, processes the collected data, performs threat analysis in which data is correlated with other sensor, surveillance, and advisory inputs, and then disseminates resultant threat information to emergency personnel and other agencies. In response to identified threats, the operator may request activation of barrier and safeguard systems to preclude an incident, control access during and after an incident or mitigate impact of an incident. The sensors may be in secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. The types of sensors include acoustic, threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity, motion and object sensors.*
	Center Secure Area Surveillance	*This equipment package monitors surveillance inputs from secure areas in the transportation system. The surveillance may be of secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. It provides both video and audio surveillance information to emergency personnel and automatically alerts emergency personnel of potential incidents.*
	Emergency Early Warning System	This equipment package monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to other equipment packages that provide the emergency response, including public notification using ITS traveler information systems, where appropriate.
	Emergency Environmental Monitoring	This equipment package collects current and forecast road conditions and surface weather information from a variety of sources, including both weather service providers and vehicle probes. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.

Subsystem	Equipment Package	Description
Maintenance and Construction Management	**MCM Incident Management**	This equipment package supports maintenance and construction participation in coordinated incident response. Incident notifications are shared, incident response resources are managed, and the overall incident situation and incident response status is coordinated among allied response organizations.
Security Monitoring Subsystem	*Field Secure Area Sensor Monitoring*	*This equipment package includes sensors that monitor conditions of secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, and transit railways or guideways). A range of acoustic, environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity and motion and object sensors are included.*
	Field Secure Area Surveillance	*This equipment package includes video and audio surveillance equipment that monitors conditions of secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. as bridges, tunnels, interchanges, and transit railways or guideways). It provides the surveillance information to the Emergency Management Subsystem for possible threat detection. The equipment package also provides local processing of the video or audio information, providing processed or analyzed results to the Emergency Management Subsystem. This equipment package provides the same functions as the Traveler Secure Area Surveillance equipment package.*
Traffic Management	**TMC Incident Detection**	This equipment package identifies and reports incidents to Traffic Operations Personnel. It remotely monitors and controls traffic sensor and surveillance systems that support incident detection and verification. It analyzes and reduces the collected sensor and surveillance data, external alerting and advisory and incident reporting systems, anticipated demand information from intermodal freight depots, special event information, and identifies and reports incidents and hazardous conditions
Transit Management	**Transit Center Security**	This equipment package monitors transit vehicle operator or traveler activated alarms received from on-board a transit vehicle. It supports transit vehicle operator authentication and provides the capability to remotely disable a transit vehicle. This equipment package also includes the capability to alert operators and police to potential incidents identified by these security features.

Customized EM07 Market Package Information for the Tippecanoe County ITS RA:

Principal Stakeholders:

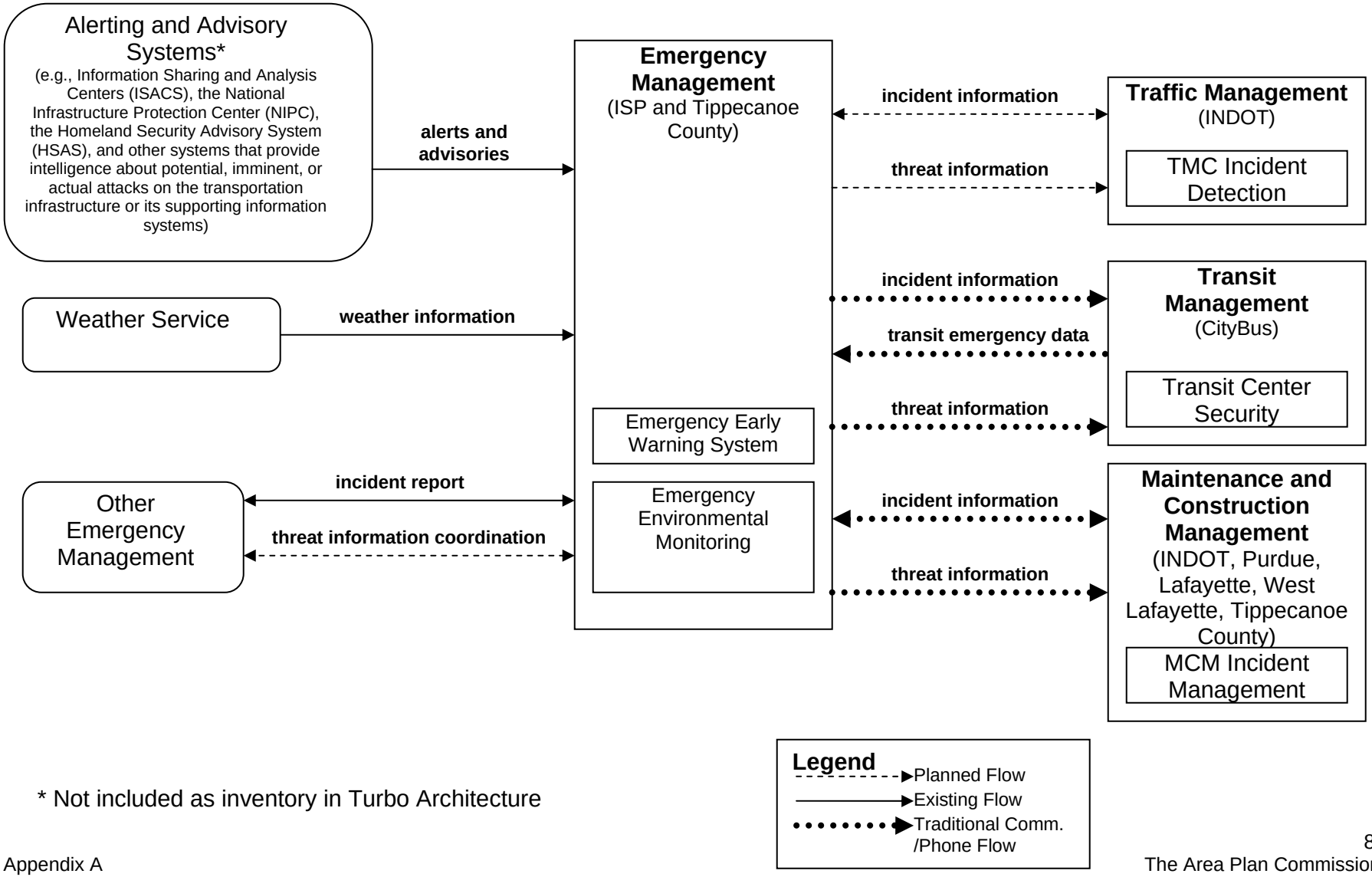
- Indiana State Police (existing)
- National Weather Service (existing)
- Tippecanoe County TEMA/Department of Homeland Security (planned)

Data Dictionary:

Flow Name	National Architecture Flow Definition
alerts and advisories	Assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), and alerts (information on imminent or in-progress emergencies). This flow also provides supporting descriptive detail on incidents, threats, and vulnerabilities to increase preparedness and support effective response to threats against the surface transportation system.
incident information	Notification of existence of incident and expected severity, location, time and nature of incident. As additional information is gathered and the incident evolves, updated incident information is provided. Incidents include any event that impacts transportation system operation ranging from routine incidents (e.g., disabled vehicle at the side of the road) through large-scale natural or human-caused disasters that involve loss of life, injuries, extensive property damage, and multi-jurisdictional response.
incident report	Report of an identified incident including incident location, type, severity and other information necessary to initiate an appropriate incident response.
threat information	Threats regarding transportation infrastructure, facilities, or systems detected by a variety of methods (sensors, surveillance, threat analysis of advisories from outside agencies, etc.).
threat information coordination	Sensor, surveillance, and threat data including raw and processed data that is collected by sensor and surveillance equipment located in secure areas.
transit emergency data	Initial notification of transit emergency at a transit stop or on transit vehicles and further coordination as additional details become available and the response is coordinated.
weather information	Accumulated forecasted and current weather data (e.g., temperature, pressure, wind speed, wind direction, humidity, precipitation, visibility, light conditions, etc.).

EM07: Early Warning System

Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



* Not included as inventory in Turbo Architecture

EM07: Early Warning System

Flow Diagram for the Tippecanoe County Regional ITS Architecture

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EM10: Disaster Traveler Information

Full Market Package Description:

This market package uses ITS to provide disaster-related traveler information to the general public, including evacuation and reentry information and other information concerning the operation of the transportation system during a disaster. This market package collects information from multiple sources including traffic, transit, public safety, emergency management, shelter provider, and travel service provider organizations. The collected information is processed and the public is provided with real-time disaster and evacuation information using ITS traveler information systems.

A disaster will stress the surface transportation system since it may damage transportation facilities at the same time that it places unique demands on these facilities to support public evacuation and provide access for emergency responders. Similarly, a disaster may interrupt or degrade the operation of many traveler information systems at the same time that safety-critical information must be provided to the traveling public. This market package keeps the public informed in these scenarios, using all available means to provide information about the disaster area including damage to the transportation system, detours and closures in effect, special traffic restrictions and allowances, special transit schedules, and real-time information on traffic conditions and transit system performance in and around the disaster.

This market package also provides emergency information to assist the public with evacuations when necessary. Information on mandatory and voluntary evacuation zones, evacuation times, and instructions are provided. Available evacuation routes and destinations and current and anticipated travel conditions along those routes are provided so evacuees are prepared and know their destination and preferred evacuation route. Information on available transit services and traveler services (shelters, medical services, hotels, restaurants, gas stations, etc.) is also provided. In addition to general evacuation information, this market package provides specific evacuation trip planning information that is tailored for the evacuee based on origin, selected destination, and evacuee-specified evacuation requirements and route parameters.

This market package augments the ATIS market packages that provide traveler information on a day-to-day basis for the surface transportation system. This market package provides focus on the special requirements for traveler information dissemination in disaster situations.

User Services Related to this Market Package: 5.3 Disaster Response And Evacuation

Equipment Packages (those in screened italics are not used in the Tippecanoe County ITS RA):

Subsystem	Equipment Package	Description
Emergency Management	**Emergency Evacuation Support**	This equipment package coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry.
	Emergency Response Management	This equipment package provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. This equipment package develops and stores emergency response plans and manages overall coordinated response to emergencies. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. This equipment package provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident.
Information Service Provider	**ISP Emergency Traveler Information**	This equipment package collects and provides emergency information to the public, including wide-area alerts and evacuation information. It provides emergency alerts, information on evacuation zones and evacuation requirements, evacuation destinations and shelter information, available transportation modes, and traffic and road conditions at the origin, destination, and along the evacuation routes. In addition to general evacuation information, personalized information including tailored evacuation routes, service information, and estimated travel times is also provided based on traveler specified origin, destination, and route parameters. Updated information is provided throughout the evacuation and subsequent reentry as status changes and plans are adapted.
	ISP Traveler Data Collection	This equipment package collects traveler-related data from other centers, consolidates, verifies, and refines the collected data, and makes this data available in a consistent format to applications that deliver traveler information. A broad range of traveler-related data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. This equipment package also shares data with other information service providers.
	Traveler Telephone Information	This equipment package services voice-based traveler requests for information that supports traveler telephone information systems like 511. The equipment package takes requests for traveler information, which could be voice-formatted traveler requests, dual-tone multifrequency (DTMF)-based requests, or a simple traveler information request, and returns the requested traveler information in the proper format. In addition to servicing requests for traveler information, this equipment package also collects and forwards alerts and advisories to traveler telephone information systems.

Subsystem	Equipment Package	Description
Personal Information Access	*Personal Basic Information Reception*	*This equipment package receives formatted traffic advisories, road conditions, transit information, broadcast alerts, and other general traveler information broadcasts and presents the information to the traveler. The traveler information broadcasts are received by personal devices including personal computers and personal portable devices such as personal digital assistants (PDAs) and pagers.*
	Personal Interactive Information Reception	*This equipment package provides traffic information, road conditions, transit information, yellow pages (traveler services) information, special event information, and other traveler information that is specifically tailored based on the traveler's request and/or previously submitted traveler profile information. The interactive traveler information capability is provided by personal devices including personal computers and personal portable devices such as personal digital assistants (PDAs).*
Remote Traveler Support	*Remote Basic Information Reception*	*This equipment package receives formatted traffic advisories, road conditions, transit information, broadcast alerts, and other general traveler information broadcasts and presents the information to the traveler with a public traveler interface. This equipment package includes the receiver and public display device such as a kiosk, large-scale display monitor or other public display.*
	Remote Interactive Information Reception	*This equipment package provides traffic information, road conditions, transit information, yellow pages (traveler services) information, special event information, and other traveler information that is specifically tailored based on the traveler's request and/or previously submitted traveler profile information. The interactive traveler information capability is provided by a public traveler interface, such as a kiosk.*
Vehicle	*Basic Vehicle Reception*	*This equipment package provides the capability for drivers to receive basic transportation information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, weather information, and broadcast alerts.*
	Interactive Vehicle Reception	*This equipment package provides drivers with personalized traveler information including traffic and road conditions, transit information, maintenance and construction information, multimodal information, event information, and weather information. The provided information is tailored based on driver requests. Both one-time requests for information and on-going information streams based on a submitted traveler profile and preferences are supported.*

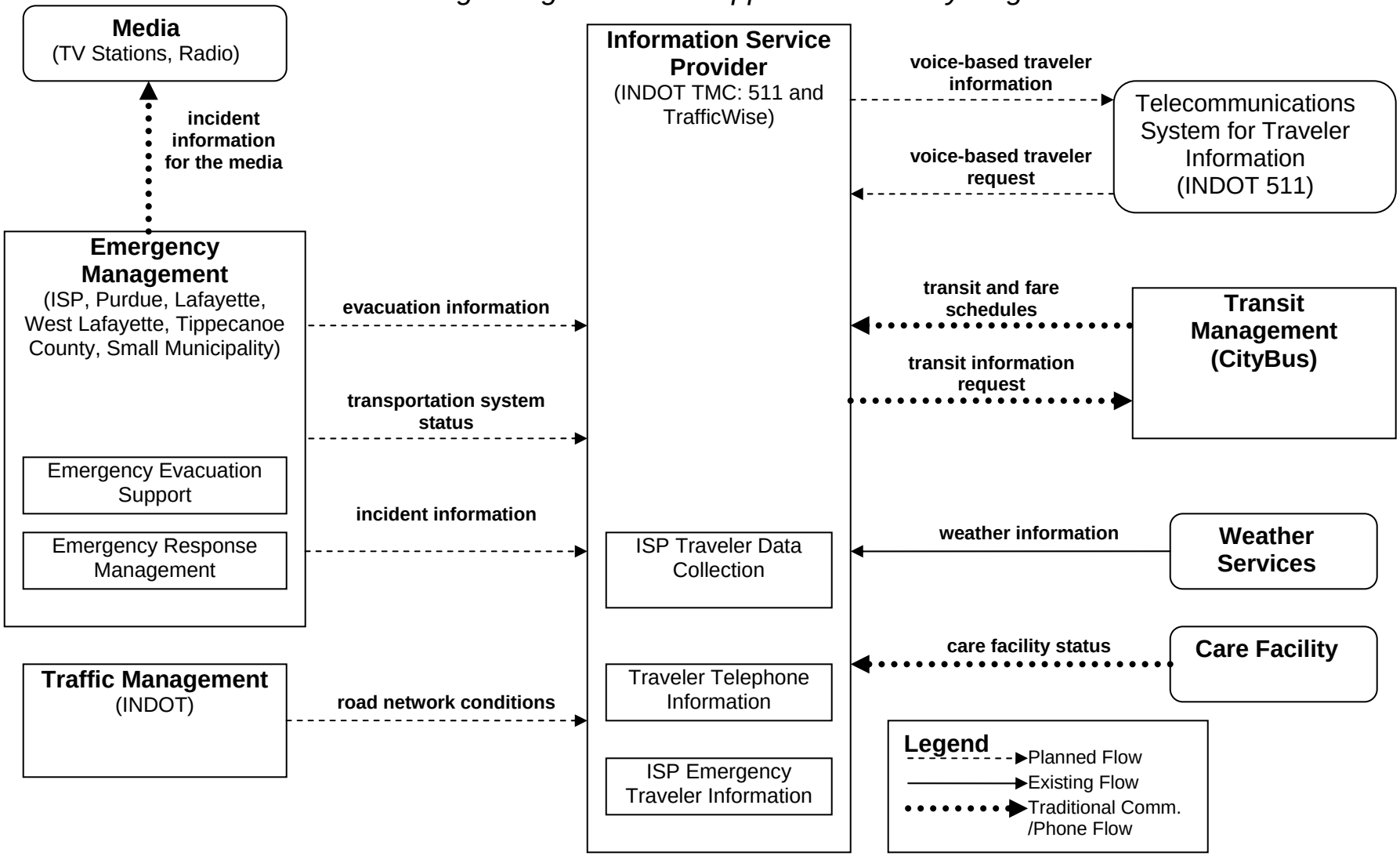
Customized EM10 Market Package Information for the Tippecanoe County ITS RA:

Principal Stakeholder: INDOT (planned)
Data Dictionary:

Flow Name	National Architecture Flow Definition
care facility status	Information regarding facility type and capabilities, facility status, and its ability to admit new patients.
evacuation information	Evacuation instructions and information including evacuation zones, evacuation times, and reentry times.
incident information	Notification of existence of incident and expected severity, location, time and nature of incident. As additional information is gathered and the incident evolves, updated incident information is provided. Incidents include any event that impacts transportation system operation ranging from routine incidents (e.g., disabled vehicle at the side of the road) through large-scale natural or human-caused disasters that involve loss of life, injuries, extensive property damage, and multi-jurisdictional response.
incident info for media	Report of current desensitized incident information prepared for public dissemination through the media.
road network conditions	Current and forecasted traffic information, road and weather conditions, traffic incident information, and other road network status. Raw data, processed data, or some combination of both may be provided by this architecture flow. Information on diversions and alternate routes, closures, and special traffic in effect is also included.
transit and fare schedules	Transit service information including routes, schedules, schedule adherence, and fare information. Includes transit service information during evacuation.
transit information request	Request for transit operations information including schedule and fare information. The request can be a subscription that initiates as-needed information updates as well as a one-time request for information.
transportation system status	Current status and condition of transportation infrastructure (e.g., tunnels, bridges, interchanges, TMC offices, maintenance facilities). In case of disaster or major incident, this flow provides an assessment of damage sustained by the surface transportation system including location and extent of the damage, estimate of remaining capacity and necessary restrictions, and time frame for repair and recovery.
voice-based traveler information	Traveler information sent to the telecommunications systems for traveler information terminator. This flow may represent the bulk transfer of traveler information, including traffic conditions, incident information, transit information and weather and road condition information. It may be specially formatted for voice-based traveler information.
voice-based traveler request	The electronic traveler information request from the telecommunications systems for traveler information terminator. It may be specifically formatted for voice-based traveler requests. The request can be a general subscription intended to initiate a continuous or regular data stream or a specific request intended to initiate a one-time response from the recipient.
weather information	Accumulated forecasted and current weather data (e.g., temperature, pressure, wind speed, wind direction, humidity, precipitation, visibility, light conditions, etc.).

EM10: Disaster Traveler Information

Customized Market Package Diagram for the Tippecanoe County Regional ITS Architecture



EM10: Disaster Traveler Information

Flow Diagram for the Tippecanoe County Regional ITS Architecture